

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y  
Edition : 7.10.86  
replaces : 9.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1150 R140  
Type number : 0 460 414 009

Customer-specific information  
Customer : IHC

Engine : DT 239/856

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2+-0,02  
(from BDC): (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Charge press. hPa: 800  
Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 800  
Charge press. hPa: 800

A01

Setting value bar: 5,3...5,9

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 92,2...93,2  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 75,5...77,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 23,0...27,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1270  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 22,0...28,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 100

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)

2nd speed 1/min: 800  
Charge press. hPa: 800  
TD travel mm: -  
mm: (4,5...4,9)

3rd speed 1/min: 1150  
Charge press. hPa: 800  
TD travel mm: 5,3...6,0  
mm: (5,0...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: 800  
Supply-pump pressure bar: 3,7...4,3  
2nd speed 1/min: 1150  
Charge press. hPa: 800  
Supply-pump pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)  
2nd speed 1/min: 1150  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 4,9  
Del. quantity cm<sup>3</sup>/1000H.: 86,4...90,4  
2nd speed 1/min: 1300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 0...2,5  
3rd speed 1/min: 1270  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (21,5...29,5)  
4th speed 1/min: 1230  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (65,5...74,5)  
5th speed 1/min: 1130  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (85,4...88,4)  
(84,3...98,5)  
6th speed 1/min: 800  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (90,1...95,3)  
7th speed 1/min: 800  
Charge press. hPa: 300  
Del. quantity cm<sup>3</sup>/1000H.: (85,0...91,8)  
8th speed 1/min: 500  
Charge press. hPa: 230  
Del. quantity cm<sup>3</sup>/1000H.: (83,5...84,5)  
(81,4...86,6)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: (73,9...79,1)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/1000H.: -

Electr. shutoff:  
Speed 1/min: 1150  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000H.: (20,5...29,5)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000H.: (5,0...11,0)  
(3,5...12,5)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 220  
Del. quantity cm<sup>3</sup>/ind.: 100,0  
2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/ax.: 80,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,4
MS	mm	:	1,2...1,4
SVS max.	mm	:	5,0
XK	mm	:	20,2...22,2
XL	mm	:	12,3...15,7

Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 4,0 H  
Edition : 30.9.86  
replaces : 7.84  
Calibrating oil : ISO-4113  
Injection pump : VE 4/11F1100 R94-1  
Type number : 0 460 414 011

Customer-specific information  
Customer : STEYER

Engine : WD 411.89/90

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Setting value mm: 5,2... 5,6

Supply-pump pressure:

Speed 1/min: 1000  
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del.quantity cm3/  
1000H.: 73,5...74,5  
Dispersion cm3/: 3,0  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 300  
Del.quantity cm3/  
1000H.: 11,5...15,5  
Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm3/  
1000H.: 50,0...56,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1100  
TD travel mm: 5,9...6,7  
mm: (5,6...7,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,8...3,4  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 1100  
Oveflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270  
Del.quantity cm3/: -  
1000H.: 0...2,0  
2nd speed 1/min: 1200  
Del.quantity cm3/: 14,0...22,0  
1000H.: (13,5...22,5)  
3rd speed 1/min: 1150  
Del.quantity cm3/: -  
1000H.: (48,5...57,5)  
4th speed 1/min: 1080  
Del.quantity cm3/: 72,5...74,5  
1000H.: (70,8...76,2)  
5th speed 1/min: 1000

Del. quantity cm<sup>3</sup>/: -  
1000H.: (71,3...76,7)  
6th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 66,0...70,0  
1000H.: (64,6...71,4)

Zero delivery (stop):  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (9,0...18,0)  
2nd speed 1/min: 340  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 170  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0

2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm : 3,2-3,4  
KF mm : 5,2-5,5  
MS mm : 0,9-1,1  
SVS max. mm : 4,0

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y6  
Edition : 12.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F1090 R176  
Type number : 0 460 414 016  
  
Customer-specific information  
Customer : IHC  
  
Engine : D239-E833

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
  
Opening  
pressure bar : 172...175  
  
Perforated-plate  
diameter mm : 0.6  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Start of delivery  
Prestroke mm : 0,2  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Setting value mm: 4,8...5,2

Supply-pump pressure:

Speed 1/min: 800  
Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 800  
Del.quantity cm<sup>3</sup>/  
1000H.: 81,5...82,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 21,5...25,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 12,0...18,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm<sup>3</sup>/1000H.: 100

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 800  
TD travel mm: -  
mm: (4,3...5,7)  
3rd speed 1/min: 1050  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 3,5...4,1  
2nd speed 1/min: 1050  
Supply-pump  
pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Oveflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1090  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (10,5...19,5)  
4th speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 47,0...53,0  
1000H.: (45,5...54,5)  
5th speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 78,5...81,5  
1000H.: (77,4...82,6)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (79,4...84,6)  
7th speed 1/min: 650  
Del. quantity cm<sup>3</sup>/: 75,0...79,0  
1000H.: (73,6...80,4)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 65,5...69,5  
1000H.: (64,1...70,9)

Zero delivery (stop):  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (19,0...28,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4,5...10,5  
1000H.: (3,0...12,0)  
3rd speed 1/min: 460  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 220  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 100,0  
2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,1...5,4

MS mm : 1,0..1,25  
SVS max. mm : 3,2

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 C  
Edition : 3.12.86  
replaces : 4.86  
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1900 L217  
Type number : O 460 414 027

Customer-specific information  
Customer : VOLVO PENTA

Engine : TAMD 31

Power k: 95

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 93,5...94,5  
Dispersion cm3/ : 5,0  
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm3/  
1000H.: 58,5...59,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 23,0...27,0  
Dispersion cm3/ : 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H: 31,0...37,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 100

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump pressure bar: 2,7...3,3  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: -  
Overflow quantity cm3/10s: 46...83  
(21...98)  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 6,4  
Del. quantity cm3/ : 83,5...84,5  
1000H.: (81,3...86,7)  
2nd speed 1/min: 2230  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...3,0  
3rd speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (29,5...38,5)  
4th speed 1/min: 2050  
Charge press. hPa: 1000  
Del. quantity cm3/ : 67,0...77,0  
1000H.: (67,5...76,5)  
5th speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm3/ : 83,0...86,0  
1000H.: (81,8...87,2)  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (91,3...96,7)  
7th speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/ : 97,2...99,8  
1000H.: (95,8...101,2)  
8th speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/ : 96,5...99,5  
1000H.: (94,6...101,4)  
9th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (56,3...61,7)

Zero delivery (stop):



Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 1090  
ELAB volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (20,5..29,5)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 7,0...13,0  
1000H.: (5,5...14,5)  
3rd speed 1/min: 480  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 74,0

2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 72,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,2...5,5
MS	mm	: 1,2...1,4
SVS max.	mm	: 3,8
XK	mm	: 18,8...20,8
XL	mm	: 14,3...17,7

Remarks:

Pushing electromagnet.

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A1  
Edition : 4.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1625 L217-2  
Type number : O 460 414 031

Customer-specific information  
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 31

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 83,5...84,5  
Dispersion cm3/: 5,0  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm3/  
1000H.: 18,0...22,0  
Dispersion cm3/: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800  
Del. quantity cm3/  
1000H.: 31,0...37,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 95,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 1625  
TD travel mm: 5,0...5,8  
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,7...3,3  
2nd speed 1/min: 1625  
Supply-pump pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Overflow quantity cm3/10s: 46...83  
quantity cm3/10s: (21...98)  
2nd speed 1/min: 1625  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1970  
Del. quantity cm3/: -  
1000H.: 0...3,0  
3rd speed 1/min: 1880  
Del. quantity cm3/: 3,0...11,0  
1000H.: (2,5...11,5)  
4th speed 1/min: 1800  
Del. quantity cm3/: -  
1000H.: (29,5...38,5)  
5th speed 1/min: 1750  
Del. quantity cm3/: 53,0...61,0  
1000H.: (52,5...61,5)  
6th speed 1/min: 1625  
Del. quantity cm3/: 78,5...81,5  
1000H.: (77,3...82,7)  
7th speed 1/min: 1500  
Del. quantity cm3/: -  
1000H.: (81,3...86,7)  
8th speed 1/min: 1000  
Del. quantity cm3/: 91,7...94,3  
1000H.: (90,3...95,7)  
9th speed 1/min: 800  
Del. quantity cm3/: 90,0...93,0  
1000H.: (88,1...94,9)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 1625  
ELAB volt: 12,0  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/: -  
1000H.: (15,5...24,5)  
2nd speed 1/min: 400  
Del. quantity cm3/: 4,0...10,0  
1000H.: (2,5...11,5)  
3rd speed 1/min: 450  
Del. quantity cm3/: -  
1000H.: 0...3,0

2nd speed 1/min: 600  
Del. quantity cm3/: -  
ax. 1000H: 90,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 1,2...1,45
SVS max.	mm	: 1,2
XK	mm	: 18,8...20,8
XL	mm	: 11,1...14,5

Remarks:

Pushing electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A  
Edition : 4.12.86  
replaces : 4.86  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F1900 L217-3  
Type number : 0 460 414 032

Customer-specific information  
Customer : VOLVO PENTA

Engine : TMD 31

Power k: 74

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 688 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 5,3...5,7

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 6,4...7,0

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 72,0...73,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,0  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm<sup>3</sup>/  
1000H.: 54,0...55,0

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 18,0...22,0

Full-load speed regulation:

Speed 1/min: 2150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...18,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 90,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (4,8...6,2)

3rd speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 6,3...7,1  
mm: (6,0...7,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2,9...3,5

2nd speed 1/min: 1900  
Supply-pump pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: -  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 6,3  
Del. quantity cm3/1000H.: 67,5...68,5  
2nd speed 1/min: 2220  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 0...3,0  
3rd speed 1/min: 2150  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 10,5...19,5  
4th speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 50,5...60,5  
5th speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 67,5...70,5  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 69,9...75,1  
7th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 73,0...76,0  
8th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/1000H.: 51,9...57,1

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm3/1000H.: -

Electr. shutoff:  
Speed 1/min: 1900

ELAB volt: 12,0  
Del. quantity cm3/1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/1000H.: (15,5...24,5)  
2nd speed 1/min: 400  
Del. quantity cm3/1000H.: 4,5...10,5  
3rd speed 1/min: 450  
Del. quantity cm3/1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400  
Del. quantity cm3/1000H.: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 500  
Del. quantity cm3/1000H.: -  
ax. 1000H.: 65,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,2...5,5  
MS mm : 1,2...1,4  
SVS max. mm : 3,8

Remarks:  
Pushing electromagnet.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,0 P1  
Edition : 2.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/11F1625 L111-3  
Type number : 0 460 414 033

Customer-specific information  
Customer : VOLVO-PENTA

Engine : TAMD 30 A

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 2,6...3,0

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 6,2...6,8

Full-load del. w/out charge press.:

Speed 1/min : 1500

Del. quantity cm<sup>3</sup>/  
1000H.: 62,0...63,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 325  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,0...30,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/  
1000H.: 6,0...14,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (2,1...3,5)  
3rd speed 1/min: 1625  
TD travel mm: 3,0...3,6  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,2...3,8  
2nd speed 1/min: 1625  
Supply-pump  
pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1625  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2100

Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...2,0  
 2nd speed 1/min: 2000  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (5,5...14,5)  
 3rd speed 1/min: 1800  
 Del. quantity cm<sup>3</sup>/: 46,5...52,5  
 1000H.: (45,0...54,0)  
 4th speed 1/min: 1625  
 Del. quantity cm<sup>3</sup>/: 58,5...61,5  
 1000H.: (57,3...62,7)  
 5th speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (59,8...65,2)  
 6th speed 1/min: 1000  
 Del. quantity cm<sup>3</sup>/: 61,5...63,5  
 1000H.: (59,8...65,2)  
 7th speed 1/min: 600  
 Del. quantity cm<sup>3</sup>/: 52,5...56,5  
 1000H.: (51,1...57,9)

Zero delivery (stop):  
 1000H.

Idle delivery:

1st speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (23,5...32,5)  
 2nd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...3,0  
 3rd speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H: 70,0  
 2nd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: -  
 ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
 K mm : -  
 KF mm : 5,7...6,0  
 MS mm : 1,2...1,45  
 SVS max. mm : 5,0

Remarks:  
 Pushing electromagnet.



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 A2  
Edition : 4.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/11F1625 L217-4  
Type number : 0 460 414 034

Customer-specific information  
Customer : VOLVO PENTA

Engine : TAM 31

Power k: 81

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 6,1...6,7

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del.quantity cm3/  
1000H.: 83,5...84,5  
Dispersion cm3/  
1000H.: 5,0

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm3/  
1000H.: 18,0...22,0  
Dispersion cm3/  
1000H.: 3,5

Full-load speed regulation:

Speed 1/min: 1800  
Del.quantity cm3/  
1000H.: 31,0...37,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 95,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 1625  
TD travel mm: 5,0...5,8  
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,7...3,3  
2nd speed 1/min: 1625  
Supply-pump  
pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1625  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1970  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...3,0

2nd speed 1/min: 1880  
 Del. quantity cm<sup>3</sup>/: 3,0...10,0  
 1000H.: (2,5...11,5)

3rd speed 1/min: 1800  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (29,5...38,5)

4th speed 1/min: 1750  
 Del. quantity cm<sup>3</sup>/: 53,0...61,0  
 1000H.: (52,5...61,5)

5th speed 1/min: 1625  
 Del. quantity cm<sup>3</sup>/: 78,5...81,5  
 1000H.: (77,3...82,7)

6th speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (81,3...86,7)

7th speed 1/min: 1000  
 Del. quantity cm<sup>3</sup>/: 91,7...94,3  
 1000H.: (90,3...95,7)

8th speed 1/min: 800  
 Del. quantity cm<sup>3</sup>/: 90,0...93,0  
 1000H.: (88,1...94,9)

Zero delivery (stop):  
 1000H.

Idle delivery:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (15,5...19,5)

2nd speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 4,0...10,0  
 1000H.: (2,5...11,5)

3rd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...3,0

2nd speed 1/min: 600  
 Del. quantity cm<sup>3</sup>/: -  
 ax. 1000H: 90,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K mm : -  
 KF mm : K-3T  
 MS mm : 1,2...1,45  
 XK mm : 18,8...20,8  
 XL mm : 11,1...14,5

Remarks:

Pushing electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 3,1 E  
Edition : 3.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F1300 L251  
Type number : 0 460 414 037

Customer-specific information  
Customer : VOLVO-PENTA

Engine : TD 31

Power k: 49

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 6800 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,2  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 800  
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 800  
Setting value bar: 4,8...5,4

Full-load del. with charge press.:

Speed 1/min: 1100  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 60,5...61,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5

Full-load del. w/out charge press.:

Speed 1/min : 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 47,0...48,0

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 18,0...22,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5

Full-load speed regulation:

Speed 1/min: 1350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H: 28,0...34,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900  
Charge press. hPa: 800  
TD travel mm: 0,2...1,0  
mm: (0...1,3)  
2nd speed 1/min: 1100  
Charge press. hPa: 800  
TD travel mm: -  
mm: (0,9...2,3)  
3rd speed 1/min: 1300  
Charge press. hPa: 800  
TD travel mm: 2,3...3,1  
mm: (2,0...3,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 800

Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 1300  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 5,6...6,2

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 800  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1300  
Charge press. hPa: 800  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 400  
Del. quantity cm<sup>3</sup>/: 47,0...48,0  
1000H.: (44,8...50,2)  
2nd speed 1/min: 1450  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5  
3rd speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 9,0...16,0  
1000H.: (8,0...17,0)  
4th speed 1/min: 1350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (26,5...35,5)  
5th speed 1/min: 1250  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 60,5...63,5  
1000H.: (59,3...64,7)  
6th speed 1/min: 1100  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (58,3...63,7)  
7th speed 1/min: 600  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 50,0...53,0  
1000H.: (48,1...54,9)  
8th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (38,3...43,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,5...24,5)  
2nd speed 1/min: 380  
Del. quantity cm<sup>3</sup>/: 5,0...11,0  
1000H.: (3,5...12,5)  
3rd speed 1/min: 420  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 52,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,7...6,0  
MS mm : 1,2...1,45  
SVS max. mm : 4,4

Remarks:

Correction at adjusting nut (46)

Pushing electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 K  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/11F1350 R257  
Type number : 0 460 414 039  
Customer-specific information  
Customer : FIAT-IVECO  
Engine : 8040.25.200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
Inlet press., bar : 0.2  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
Opening  
pressure bar : 172...175  
Perforated-plate  
diameter mm : 0.6  
Test inj. tubing : 1 680 750 017  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
Start of delivery  
Prestroke mm : 0,4  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1000  
Charge press. hPa: 1000

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Setting value bar: 5,7...6,3

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 93,5...94,5  
Dispersion cm<sup>3</sup>/  
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 68,5...69,5

Low-idle speed regulation:

Speed 1/min: 400  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 19,0...23,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 85,0...88,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 90,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,3...3,7)  
3rd speed 1/min: 1350  
Charge press. hPa: 1000  
TD travel mm: 6,3...7,1  
mm: (6,0...7,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000  
 Supply-pump pressure bar: 3,6...4,2  
 2nd speed 1/min: 800  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 4,8...5,4  
 3rd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow quantity cm<sup>3</sup>/10s: 41...83  
 quantity cm<sup>3</sup>/10s: (26...98)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Overflow quantity cm<sup>3</sup>/10s: 55...138  
 quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting point hPa: 250  
 Del. quantity cm<sup>3</sup>/1000H.: 76,5...77,5  
 quantity cm<sup>3</sup>/1000H.: (74,4...79,6)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 0...2,5  
 3rd speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 16,0...22,0  
 quantity cm<sup>3</sup>/1000H.: (14,5...23,5)  
 4th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 68,0...76,0  
 quantity cm<sup>3</sup>/1000H.: (67,5...76,5)  
 5th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 82,0...91,0  
 quantity cm<sup>3</sup>/1000H.: (82,0...91,0)  
 6th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 91,4...96,6  
 quantity cm<sup>3</sup>/1000H.: (91,4...96,6)  
 7th speed 1/min: 500  
 Charge press. hPa: 1000  
 Del. quantity cm<sup>3</sup>/1000H.: 82,0...85,0  
 quantity cm<sup>3</sup>/1000H.: (80,9...86,1)  
 8th speed 1/min: 500  
 Charge press. hPa: -  
 Del. quantity cm<sup>3</sup>/1000H.: 66,4...71,6  
 quantity cm<sup>3</sup>/1000H.: (66,4...71,6)

Zero delivery (stop):

Mech. shutoff:  
 Speed 1/min: 1350  
 Del. quantity cm<sup>3</sup>/1000H.: -

Idle delivery:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/1000H.: (16,5...25,5)  
 2nd speed 1/min: 430  
 Del. quantity cm<sup>3</sup>/1000H.: (2,5...9,5)  
 3rd speed 1/min: 480  
 Del. quantity cm<sup>3</sup>/1000H.: (1,5...10,5)  
 Del. quantity cm<sup>3</sup>/1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150  
 Del. quantity cm<sup>3</sup>/ind.: -  
 ind. 1000H.: 90,0  
 2nd speed 1/min: 230  
 Del. quantity cm<sup>3</sup>/ax.: -  
 ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in min. voltage : 20,0  
 Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,2...5,5
MS	mm	: 1,3...1,55
SVS max.	mm	: 5,6
XK	mm	: 17,0...19,0
XL	mm	: 14,2...17,6

Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6K1  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F1500 R264  
Type number : 0 460 414 040  
  
Customer-specific information  
Customer : FIAT-IVECO  
  
Engine : 8040.05.200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
  
Opening  
pressure bar : 172...175  
  
Perforated-plate  
diameter mm : 0.6  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Start of delivery  
Prestroke mm : 0,2  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1000  
Setting value mm: 3,5...3,9

### Supply-pump pressure:

Speed 1/min: 1000  
Setting value bar: 4,5...5,1

### Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del.quantity cm3/  
1000H.: 55,0...56,0  
Dispersion cm3/: 3,5  
1000H.: (4,0)

### Low-idle speed regulation:

Speed 1/min: 325  
Del.quantity cm3/  
1000H.: 7,0...11,0  
Dispersion cm3/: 3,5  
1000H.: (4,0)

### Full-load speed regulation:

Speed 1/min: 1600  
Del.quantity cm3/  
1000H.: 38,0...44,0

### Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 65,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 1000  
TD travel mm: -  
mm: (3,0...4,4)  
3rd speed 1/min: 1300  
TD travel mm: 5,8...6,4  
mm: (5,4...6,8)  
4th speed 1/min: 1500  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

### Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 3,3...3,9  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 6,3...6,9

### Overflow quantity at overflow valve:

1st speed 1/min: 700  
Overflow : 41...83  
quantity cm3/10s: (26...98)

2nd speed 1/min: 1500  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1750  
Del. quantity cm3/: -  
1000H.: 0...2,5  
3rd speed 1/min: 1650  
Del. quantity cm3/: 15,5...24,5  
1000H.: (15,5...24,5)  
4th speed 1/min: 1600  
Del. quantity cm3/: -  
1000H.: (36,5...45,5)  
5th speed 1/min: 1500  
Del. quantity cm3/: 52,5...55,5  
1000H.: (51,4...56,6)  
6th speed 1/min: 1300  
Del. quantity cm3/: 51,5...54,5  
1000H.: (50,4...55,6)  
7th speed 1/min: 1000  
Del. quantity cm3/: -  
1000H.: (52,9...58,1)  
8th speed 1/min: 700  
Del. quantity cm3/: 53,0...56,0  
1000H.: (51,1...57,9)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1500  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 325  
Del. quantity cm3/: -  
1000H.: (4,5...13,5)  
2nd speed 1/min: 360  
Del. quantity cm3/: 1,5...7,5  
1000H.: (0...9,0)  
3rd speed 1/min: 420  
Del. quantity cm3/: -  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm3/: -  
ind. 1000H: 70,0  
2nd speed 1/min: 230  
Del. quantity cm3/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0

Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,8...2,05
SVS max.	mm	:	-
XK	mm	:	17,0...19,0
XL	mm	:	13,1...16,5

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,6 K2  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1350 R268  
Type number : 0 460 414 043

Customer-specific information  
Customer : FIAT-IVECO

Engine : 8040.25R230

Power k: 74

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,4  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Setting value mm: 4,2...4,6

Supply-pump pressure:

Speed 1/min: 1000

Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 800  
Del.quantity cm<sup>3</sup>/  
1000H.: 82,5...83,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: 22,0...26,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1500  
Del.quantity cm<sup>3</sup>/  
1000H: 23,0...29,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm<sup>3</sup>/1000H.: 90,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 1,2...2,0  
mm: (0,9...2,3)  
2nd speed 1/min: 1000  
TD travel mm: -  
mm: (3,7...5,1)  
3rd speed 1/min: 1200  
TD travel mm: 5,7...6,3  
mm: (5,3...6,7)  
4th speed 1/min: 1350  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 3,1...3,7  
2nd speed 1/min: 700  
Supply-pump pressure bar: 4,0...4,6  
3rd speed 1/min: 1350  
Supply-pump pressure bar: 6,6...7,2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1350  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 1600  
Del.quantity cm<sup>3</sup>/  
1000H.: 0...2,5  
3rd speed 1/min: 1550  
Del.quantity cm<sup>3</sup>/  
1000H.: (1,0...10,0)  
4th speed 1/min: 1500  
Del.quantity cm<sup>3</sup>/  
1000H.: (21,5...30,5)  
5th speed 1/min: 1350  
Del.quantity cm<sup>3</sup>/  
1000H.: (70,9...76,1)  
6th speed 1/min: 1250  
Del.quantity cm<sup>3</sup>/  
1000H.: (73,9...79,1)  
7th speed 1/min: 800  
Del.quantity cm<sup>3</sup>/  
1000H.: (80,4...85,6)  
8th speed 1/min: 500  
Del.quantity cm<sup>3</sup>/  
1000H.: (64,6...71,4)

Zero delivery (stop):  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/  
1000H.: (19,5...28,5)  
2nd speed 1/min: 400  
Del.quantity cm<sup>3</sup>/  
1000H.: (1,5...10,5)  
3rd speed 1/min: 460  
Del.quantity cm<sup>3</sup>/  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm<sup>3</sup>/  
ind. 1000H: 90,0  
2nd speed 1/min: 230  
Del.quantity cm<sup>3</sup>/  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,2...5,5
MS	mm	: 1,3...1,55
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 14,0...17,4

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y1  
Edition : 10.12.86  
replaces : 9.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/11F1150 R140-1  
Type number : 0 460 414 049

Customer-specific information  
Customer : IHC

Engine : DT 239/856

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Charge press. hPa: 800  
Setting value mm: 4,5...4,9

Supply-pump pressure:

Speed 1/min: 800  
Charge press. hPa: 800

Setting value bar: 5,3...5,9

Full-load del. with charge press.:

Speed 1/min: 800  
Charge press. hPa: 800  
Del. quantity cm3/  
1000H.: 92,2...93,2  
Dispersion cm3/ : 3,5  
1000H.: (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm3/  
1000H.: 75,5...77,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 23,0...27,0  
Dispersion cm3/ : 3,5  
1000H.: (4,0)

Full-load speedregulation:

Speed 1/min: 1270  
Charge press. hPa: 800  
Del. quantity cm3/  
1000H.: 22,0...28,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity mind.  
cm3/1000H.: 100

Insertion pump test specifications  
Test specifications in parentheses

Timing device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 800  
Charge press. hPa: 800  
TD travel mm: -  
mm: (4,5...4,9)  
3rd speed 1/min: 1150  
Charge press. hPa: 800  
TD travel mm: 5,3...6,0  
mm: (5,0...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 3,7...4,3  
2nd speed 1/min: 1150  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 55...138  
quantity cm3/10s: (40...153)  
2nd speed 1/min: 1150  
Charge press. hPa: 800  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,9  
Del. quantity cm3/ : 86,4...90,4  
1000H.: -  
2nd speed 1/min: 1300  
Charge press. hPa: 800  
Del. quantity cm3/ : -  
1000H.: 0...2,5  
3rd speed 1/min: 1270  
Charge press. hPa: 800  
Del. quantity cm3/ : -  
1000H.: 21,5...29,5))  
4th speed 1/min: 1230  
Charge press. hPa: 800  
Del. quantity cm3/ : 66,0...74,0  
1000H.: (65,5...74,5)  
5th speed 1/min: 1130  
Charge press. hPa: 800  
Del. quantity cm3/ : 85,4...88,4  
1000H.: (84,3...98,5)  
6th speed 1/min: 800  
Charge press. hPa: 800  
Del. quantity cm3/ : -  
1000H.: (90,1...95,3)  
7th speed 1/min: 800  
Charge press. hPa: 300  
Del. quantity cm3/ : -  
1000H.: (85,0...91,8)  
8th speed 1/min: 500  
Charge press. hPa: 230  
Del. quantity cm3/ : 83,5...84,5  
1000H.: (81,4...86,6)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (73,9...79,1)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (20,5..29,5)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 5,0...11,0  
1000H.: (3,5...12,5)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 220  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 100,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,4
MS	mm	:	1,2...1,4
SVS max.	mm	:	5,0
XK	mm	:	20,2...22,2
XL	mm	:	12,3...15,7

Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : IHC 3,9 Y7  
Edition : 12.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F109C R176-1  
Type number : 0 460 414 050  
  
Customer-specific information  
Customer : IHC  
  
Engine : D239-E833

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
  
Opening  
pressure bar : 172...175  
  
Perforated-plate  
diameter mm : 0.6  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Start of delivery  
Prestroke mm : 0,2  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 800  
Setting value mm: 4,8...5,2

### Supply-pump pressure:

Speed 1/min: 800  
Setting value bar: 5,1...5,7

### Full-load del. w/out charge press.:

Speed 1/min: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 81,5...82,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

### Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 21,5...25,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

### Full-load speed regulation:

Speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...18,0

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 100

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 400  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 800  
TD travel mm: -  
mm: (4,3...5,7)  
3rd speed 1/min: 1050  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

### Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 3,5...4,1  
2nd speed 1/min: 1050  
Supply-pump  
pressure bar: 6,0...6,6

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1090  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1270  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (10,5...19,5)  
4th speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 47,0...53,0  
1000H.: (45,5...54,5)  
5th speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 78,5...81,5  
1000H.: (77,4...82,6)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (79,4...84,6)  
7th speed 1/min: 650  
Del. quantity cm<sup>3</sup>/: 75,0...79,0  
1000H.: (73,6...80,4)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 65,5...69,5  
1000H.: (64,1...70,9)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1090  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (19,0...28,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4,5...10,5  
1000H.: (3,0...12,0)  
3rd speed 1/min: 460  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 220  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 100,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

B04

Designation

K mm : -  
KF mm : 5,1...5,4  
MS mm : 1,0...1,25  
SVS max. mm : 3,2

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA 2,4 B  
Edition : 3.12.86  
replaces : 4.84  
Calibrating oil : ISO 4113

Injection pump : VE 5/11F1900 L179  
Type number : 0 460 415 007

Customer-specific information  
Customer : MOTORI VM

Engine : HR 592 HTJ/9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 4,7...5,3

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 66,5...67,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 41,5...42,5

Low-idle speed regulation:

Speed 1/min: 420  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,5...24,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2060  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 36,0...42,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (4,4...5,8)  
3rd speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 7,1...7,9  
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 1,7...2,3

2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6,0...6,6

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: 51,0...52,0  
(48,1...54,9)

2nd speed 1/min: 2200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...3,0

3rd speed 1/min: 2160  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,0...8,0  
(0,5...9,5)

4th speed 1/min: 2060  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (34,5...43,5)

5th speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,0...62,0  
(57,8...63,2)

6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (64,3...69,7)

7th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (38,6...45,4)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/  
1000H.:

Electr. shutoff:  
Speed 1/min: 1900  
ELAB volt: 12,0  
Del. quantity cm<sup>3</sup>/  
1000H.:

Idle delivery:

1st speed 1/min: 420  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (18,0..27,0)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 14,0..20,0  
1000H.: (12,5..21,5)  
3rd speed 1/min: 650  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 280  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 50,0  
2nd speed 1/min: 380  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 55,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,9...6,1  
MS mm : 0,9...1,1  
SVS max. mm : 3,2

Remarks:  
Pushing electromagnet.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,5 0  
Edition : 16.12.86  
replaces : 6.84  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/11F1250 R181  
Type number : 0 460 416 036  
  
Customer-specific information  
Customer : FIAT  
  
Engine : 8065.06.200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
  
Opening  
pressure bar : 172...175  
  
Perforated-plate  
diameter mm : 0.6  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1000  
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 800

Del. quantity cm<sup>3</sup>/  
1000H.: 63,5...64,5  
Dispersion cm<sup>3</sup>/: 3,5  
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 325  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...12,0  
Dispersion cm<sup>3</sup>/: 3,5  
1000H.: (4,0)

Full-load speed regulation:

Speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/  
1000H.: 33,0...39,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 95,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,7...1,5  
mm: (0,4...1,8)  
2nd speed 1/min: 1000  
TD travel mm: -  
mm: (4,4...5,8)  
3rd speed 1/min: 1250  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3,1...3,7  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 1450

Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: 2,0...9,0  
1000H.: (1,0...10,0)  
4th speed 1/min: 1350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (31,5...40,5)  
5th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: 53,0...56,0  
1000H.: (51,9...57,1)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (61,4...66,6)  
7th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 58,5...61,5  
1000H.: (56,6...63,4)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 325  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,5...14,5)  
2nd speed 1/min: 360  
Del. quantity cm<sup>3</sup>/: 2,0...8,0  
1000H.: (0,5...9,5)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 95,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,2...5,4  
MS mm : 1,5...1,7  
SVS max. mm : 4,3

XK mm : 25,0...27,0  
XL mm : 13,4...16,8

Remarks:

B09

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 C  
Edition : 02.04.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218  
Type number : 0 460 416 047

Customer-specific information  
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 147

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 6,6...7,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 102,0...103,0  
Dispersion cm3/ : 3,5  
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm3/  
1000H.: 65,5...66,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 18,0...22,0  
Dispersion cm3/ : 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H: 67,0...73,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 80.0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 1,0...2,0  
mm: (0,8...2,2)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,1...4,5)  
3rd speed 1/min: 1700  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)  
4th speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5,5...6,1  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 650  
Charge press. hPa: -  
Overflow quantity cm3/10s: 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 200  
Del. quantity cm3/ : 86,5...87,5  
1000H.: (84,3...89,7)  
2nd speed 1/min: 2200  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...2,5  
3rd speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/ : 5,0...15,0  
1000H.: (4,0...16,0)  
4th speed 1/min: 2000  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (65,5...74,5)  
5th speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm3/ : 91,0...94,0  
1000H.: (88,0...97,0)  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (99,8...105,2)  
7th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/ : 91,0...94,0  
1000H.: (89,8...95,2)  
8th speed 1/min: 800  
Charge press. hPa: -  
Del. quantity cm3/ : 68,8...71,2  
1000H.: (66,7...73,4)  
9th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (62,6...69,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 1900  
ELAB volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,5..24,5)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 5,0...11,0  
1000H.: (3,5..12,5)  
3rd speed 1/min: 480  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 80,0  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 0,7..0,95
SVS max.	mm	: 4,0
XK	mm	: 18,8...20,8
XL	mm	: 13,7...17,1

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 D  
Edition : 02.04.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1900 L218-1  
Type number : 0 460 416 048

Customer-specific information  
Customer : VOLVO PENTA

Engine : TAMD 41

Power k: 147

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 6,6...7,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 102,0...103,0  
Dispersion cm3/ : 3,5  
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm3/  
1000H.: 65,5...66,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 18,0...22,0  
Dispersion cm3/ : 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 67,0...73,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 80,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 1,0...2,0  
mm: (0,8...2,2)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,1...4,5)  
3rd speed 1/min: 1700  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)  
4th speed 1/min: 1900  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,5)

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5,5...6,1  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 650  
Charge press. hPa: -  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 1900  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 200  
Del. quantity cm3/ : 86,5...87,5  
1000H.: (84,3...89,7)  
2nd speed 1/min: 2200  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...2,5  
3rd speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/ : 5,0...15,0  
1000H.: (4,0...16,0)  
4th speed 1/min: 2000  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (65,5...74,5)  
5th speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm3/ : 91,0...94,0  
1000H.: (88,0...97,0)  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (99,8...105,2)  
7th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/ : 91,0...94,0  
1000H.: (89,8...95,2)  
8th speed 1/min: 800  
Charge press. hPa: -  
Del. quantity cm3/ : 68,8...71,2  
1000H.: (66,6...73,4)  
9th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (62,6...69,4)

Zero delivery (stop):  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,5..24,5)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 5,0...11,0  
1000H.: (3,5...12,5)  
3rd speed 1/min: 480  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 80,0

2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : K-0T  
MS mm : 0,7..0,95  
SVS max. mm : 4,0  
XK mm : 18,8...20,8  
XL mm : 13,7...17,1

Remarks:  
Pushing electromagnet.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 4,1 E  
Edition : 8.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/11F1625 L218-4  
Type number : 0 460 416 054  
  
Customer-specific information  
Customer : VOLVO PENTA  
  
Engine : TAMD 41

Power k: 125

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 3,9...4,3

Supply-pump pressure:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 87,0...88,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,0

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,0...60,0

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 15,5...19,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5

Full-load speed regulation:

Speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,0...43,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 85,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,4...4,8)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump pressure bar: 4,7...5,3  
2nd speed 1/min: 1625  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 1625  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 260  
Del. quantity cm3/1000H.: 66,0...67,0  
1000H.: (63,8...69,2)

2nd speed 1/min: 1970  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 0...3,0

3rd speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 2,5...10,5  
1000H.: (2,0...11,0)

4th speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: (35,5...44,5)

5th speed 1/min: 1625  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 80,0...83,0  
1000H.: (78,8...84,2)

6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: (84,8...90,2)

7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 93,8...96,2  
1000H.: (92,3...97,7)

8th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/1000H.: 91,5...94,5  
1000H.: (89,6...96,4)

9th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm3/1000H.: (56,8...62,2)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/1000H.: -

Electr. shutoff:  
Speed 1/min: 1625  
ELAB volt: 12,0  
Del. quantity cm3/1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/1000H.: (13,0...22,0)

2nd speed 1/min: 400  
Del. quantity cm3/1000H.: (3,0...9,0)  
1000H.: (1,5...10,5)

3rd speed 1/min: 450  
Del. quantity cm3/1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm3/1000H.: -  
ind. 1000H.: 85,0

2nd speed 1/min: 500  
Del. quantity cm3/1000H.: -  
ax. 1000H.: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : K-0T  
MS mm : 1,2...1,45  
SVS max. mm : -  
XK mm : 18,8...20,8  
XL mm : 12,2...15,6

Remarks:  
Pushing electromagnet.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL4,1 F  
Edition : 8.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/11F1625 L218-5  
Type number : 0 460 416 055  
  
Customer-specific information  
Customer : VOLVO PENTA  
  
Engine : TAMD 41

Power k: 125

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 3,9...4,3

Supply-pump pressure:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value bar: 6,1...6,7

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 87,0...88,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,0  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 650  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,0...60,0

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 15,5...19,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,0...43,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 85,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,4...4,8)  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump pressure bar: 4,7...5,3  
2nd speed 1/min: 1625  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1625  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting point hPa: 260  
Del. quantity cm<sup>3</sup>/1000H.: 66,0...67,0  
2nd speed 1/min: 1970  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0...3,0  
3rd speed 1/min: 1900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 2,5...10,5  
4th speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 35,5...44,5  
5th speed 1/min: 1625  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 80,0...83,0  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 84,8...90,2  
7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 93,8...96,2  
8th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 91,5...94,5  
9th speed 1/min: 650  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 56,8...62,2

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/1000H.:

Electr. shutoff:  
Speed 1/min: 1625  
Del. quantity cm<sup>3</sup>/1000H.:

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000H.: (13,0...22,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000H.: (1,5...10,5)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/ind. 1000H.: 85,0  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/ax. 1000H.: 80,0

Shutoff electromagnet:

Cut-in min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation mm : -  
K mm : K-0T  
MS mm : 1,2...1,45  
SVS max. mm : 3,6  
XK mm : 18,8...20,8  
XL mm : 12,2...15,6

Remarks:  
Pushing electromagnet.

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 A5  
Edition : 22.10.86  
replaces : 4.85  
Calibrating oil : ISO-4113  
Injection pump : VE 4/12F1100 R123-5  
Type number : 0 460 424 011

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-390

Power k: 60  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
pressure bar : 207...210

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del. quantity cm3/  
1000H.: 70,5...71,5  
Dispersion cm3/  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Full-load speed regulation:

Speed 1/min: 1120  
Del. quantity cm3/  
1000H.: 52,0...58,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 97,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1100  
TD travel mm: 3,3...4,1  
mm: (3,0...4,4)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,7...4,3  
3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,2...5,8

Overflow quantity at overflow valve:

1st speed 1/min: 400



Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1230  
Del. quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1200  
Del. quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1160  
Del. quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1120  
Del. quantity cm3/: -  
1000H.: (50,0...60,0)  
6th speed 1/min: 1100  
Del. quantity cm3/: 64,5...67,5  
1000H.: (63,0...69,0)  
7th speed 1/min: 900  
Del. quantity cm3/: -  
1000H.: (68,0...74,0)  
8th speed 1/min: 750  
Del. quantity cm3/: 70,5...74,5  
1000H.: (68,8...76,2)  
9th speed 1/min: 400  
Del. quantity cm3/: 63,5...67,5  
1000H.: (61,8...69,2)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 1100  
ELAB volt: -  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/: 17,0...23,0  
1000H.: (15,0...25,0)  
2nd speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 450  
Del. quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -  
ind. 1000H: 97,0  
2nd speed 1/min: 200  
Del. quantity cm3/: -  
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,1...5,4  
MS mm : 1,4...1,6  
SVS max. mm : 3,4  
XK mm : 20,2...22,2  
XL mm : 12,5...15,9

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 A6  
Edition : 1.10.86  
replaces : 1.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/12F1050 R123-6  
Type number : 0 460 424 012

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-390 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
pressure bar : 207...210

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02(0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,5...5,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del. quantity cm<sup>3</sup>/  
1000H.: 64,5...65,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0  
(4,5)

Low-idle speed regulation:

Speed 1/min: 420  
Del. quantity cm<sup>3</sup>/  
1000H.: 18,5...24,5  
Dispersion cm<sup>3</sup>/  
1000H.: (3,5  
(4,5)

Full-load speed regulation:

Speed 1/min: 1110  
Del. quantity cm<sup>3</sup>/  
1000H.: 32,0...38,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 97,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,1...1,9  
(0,8...2,2)  
2nd speed 1/min: 900  
TD travel mm: -  
(1,8...3,2)  
3rd speed 1/min: 1050  
TD travel mm: 3,2...4,0  
(2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,8...3,4  
2nd speed 1/min: 750  
Supply-pump pressure bar: 3,8...4,4  
3rd speed 1/min: 1050  
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,5  
2nd speed 1/min: 1110  
Del. quantity cm<sup>3</sup>/  
1000H.: (30,0...40,0)  
3rd speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/  
1000H.: (59,5...62,5  
(58,0...64,0)  
4th speed 1/min: 900  
Del. quantity cm<sup>3</sup>/  
1000H.: (62,0...68,0)  
5th speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (64,0...68,0  
(63,3...68,7)  
6th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: (60,0...64,0  
(59,3...64,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/  
1000H.:

Electr. shutoff:  
Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.:

Idle delivery:

1st speed 1/min: 420  
Del. quantity cm<sup>3</sup>/  
1000H.: (16,5...26,5)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/  
ind. 1000H.: 97,0  
2nd speed 1/min: 200  
Del. quantity cm<sup>3</sup>/  
ax. 1000H.: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,2-5,5
MS	mm	: 1,4-1,65
SVS max.	mm	: 4,2
XK	mm	: 20,2-22,2
XL	mm	: 11,7-15,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022

Customer-specific information  
Customer : CUMMINS

Engine : 4BT-3.9

Power k: 70  
Speed 1/mi: 2200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7  
Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000H.: 65,5...66,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1150  
Del. quantity cm3/  
1000H.: 53,0...59,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1100  
TD travel mm: 3,1...3,9  
mm: (2,8...4,2)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant, and breakaway char.:

1st speed 1/min: 1250  
Del. quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1220  
Del. quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1180  
Del. quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1150  
Del. quantity cm3/: -  
1000H.: (51,0...61,0)  
6th speed 1/min: 1100  
Del. quantity cm3/: 63,5...66,5  
1000H.: (62,0...68,0)  
7th speed 1/min: 900  
Del. quantity cm3/: -  
1000H.: (63,0...69,0)  
8th speed 1/min: 750  
Del. quantity cm3/: 68,0...72,0  
1000H.: (66,3...73,7)  
9th speed 1/min: 500  
Del. quantity cm3/: 67,0...75,0  
1000H.: (67,3...74,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm3/: 35,0...47,0  
1000H.: (36,0...46,0)  
2nd speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 500  
Del. quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 240  
Del. quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,2...1,45
SVS max.	mm	: 4,2
XK	mm	: 20,2...22,2
XL	mm	: 11,0...14,4

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E1  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1150 R226-1  
Type number : 0 460 424 023

Customer-specific information  
Customer : CUMMINS

Engine : 4BT-3.9

Power k: 53  
Speed 1/mi: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,0...2,4

Supply-pump pressure:



Speed 1/min: 900  
Setting value bar: 4,2...4,8  
Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 67,0...68,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm3/  
1000H.: 47,0...53,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 7,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1150  
TD travel mm: 3,2...4,0  
mm: (2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,9...1,5  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,5...3,1  
3rd speed 1/min: 1150  
Supply-pump pressure bar: 5,2...5,8

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Oveflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1240  
Del.quantity cm3/: 13,0...25,0  
1000H.: (14,0...24,0)  
4th speed 1/min: 1190  
Del.quantity cm3/: -  
1000H.: (45,0...55,0)  
5th speed 1/min: 1150  
Del.quantity cm3/: 63,5...66,5  
1000H.: (62,0...68,0)  
6th speed 1/min: 900  
Del.quantity cm3/: -  
1000H.: (64,5...70,5)  
7th speed 1/min: 750  
Del.quantity cm3/: 69,5...73,5  
1000H.: (67,8...75,2)  
8th speed 1/min: 500  
Del.quantity cm3/: 68,0...76,0  
1000H.: (68,3...75,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del.quantity cm3/: 32,0...44,0  
1000H.: (33,0...43,0)  
2nd speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 500  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H.: 80,0

2nd speed 1/min: 240  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,2...1,45
SVS max.	mm	: 4,2
XK	mm	: 18,8...20,8
XL	mm	: 11,7...15,1

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E2  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2  
Type number : 0 460 424 024

Customer-specific information  
Customer : CUMMINS

Engine : 4BT 3.9

Power k: 55  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 42...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,6...5,2  
Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000H.: 65,5...66,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 335  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1290  
Del. quantity cm3/  
1000H.: 42,0...48,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1100  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 1,3...1,9  
2nd speed 1/min: 750  
Supply-pump pressure bar: 3,9...4,5  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 2,9...3,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del. quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1370  
Del. quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1330  
Del. quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1290  
Del. quantity cm3/: -  
1000H.: (40,0...50,0)  
6th speed 1/min: 1250  
Del. quantity cm3/: 63,0...66,0  
1000H.: (61,5...67,5)  
7th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (63,0...69,0)  
8th speed 1/min: 750  
Del. quantity cm3/: 69,0...73,0  
1000H.: (67,3...74,7)  
9th speed 1/min: 500  
Del. quantity cm3/: 70,0...78,0  
1000H.: (70,3...73,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 335  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 335  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H.: 75,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 75,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,2...1,45
SVS max.	mm	: 4,2
XK	mm	: 18,8...20,8
XL	mm	: 11,5...14,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D2  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1250 R231  
Type number : 0 460 424 028  
  
Customer-specific information  
Customer : CUMMINS  
  
Engine : 4BTA-3.9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
  
Opening  
pressure bar : 250...253  
  
Perforated-plate  
diameter mm : 0.5  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +0,02 (0,04)  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4,0...4,4  
  
Supply-pump pressure:  
  
Speed 1/min: 850  
Charge press. hPa: 1000

Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 85,5...86,5  
Dispersion cm3/ : 4,0  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm3/  
1000H.: 63,5...64,5

Low-idle speed regulation:

Speed 1/min: 365  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1310  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H: 61,0...67,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1,8...2,6  
mm: (1,5...2,9)  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 4,9...5,7  
mm: (4,6...6,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000

Supply-pump pressure bar: 4,0...4,6  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6,7...7,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm3/ : 79,5...80,5  
1000H.: (77,0...83,0)  
2nd speed 1/min: 1420  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...2,0  
3rd speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...15,0  
4th speed 1/min: 1360  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...15,0  
5th speed 1/min: 1310  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (59,0...69,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/ : 75,5...78,5  
1000H.: (74,0...80,0)  
7th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm3/ : 77,5...78,5  
1000H.: (76,0...80,5)  
8th speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (83,0...89,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm3/ : 91,0...99,0  
1000H.: -  
10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (61,0...67,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 365  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 365  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0  
2nd speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,1...1,35
SVS max.	mm	: 2,6
XK	mm	: 20,2...22,2
XL	mm	: 13,1...16,6

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D3  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1250 R239-1  
Type number : O 460 424 031

Customer-specific information  
Customer : CUMMINS

Engine : 4BT-3.9 AUTO

Power k: 77  
Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 0,8...1,2

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value bar: 5,7...6,3

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 82,0...83,0  
Dispersion cm<sup>3</sup>/ : 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 54,0...55,0

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 13,5...19,5  
Dispersion cm<sup>3</sup>/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,5...65,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 0,3...1,1  
mm: (0...1,4)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,3...1,7)  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2,9...3,5  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4,6...5,2  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 600  
Del. quantity cm<sup>3</sup>/: 72,0...73,0  
1000H.: (69,5...75,5)  
2nd speed 1/min: 1520  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
4th speed 1/min: 1460  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (57,5...67,5)  
6th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 75,0...78,0  
1000H.: (73,5...79,5)  
7th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 77,0...80,0  
1000H.: (75,5...81,5)  
8th speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (79,5...85,5)

9th speed 1/min: 500  
Charge press. hPa: 1000  
Del.quantity cm3/: 101,0...109,0  
1000H: (101,3...108,7)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H: (51,5...57,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (11,5...21,5)  
2nd speed 1/min: 450  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 340  
Del.quantity cm3/: -  
ind. 1000H: 75,0  
2nd speed 1/min: 440  
Del.quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 1,1..1,35
SVS max.	mm	: 3,8
XK	mm	: 20,2...22,2
XL	mm	: 12,4...15,8

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 D1  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1050 R230-3  
Type number : 0 460 424 033

Customer-specific information  
Customer : CUMMINS

Engine : 4BTA-3.9

Power k: 79  
Speed 1/mi: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 5,0...5,6

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 89,5...90,5  
Dispersion cm<sup>3</sup> / : 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 63,5...64,5

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,0...65,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 4,7...5,5  
mm: (4,4...5,8)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 79,5...80,5  
(77,0...83,0)  
2nd speed 1/min: 1180  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...2,0  
3rd speed 1/min: 1160  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...15,0  
4th speed 1/min: 1120  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...15,0  
5th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (57,0...67,0)  
6th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 76,5...79,5  
(75,0...81,0)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 82,0...85,0  
(80,5...86,5)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (87,0...93,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 91,0...99,0  
10th speed 1/min: 500  
Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
1000H: (61,0...67,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0

2nd speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,1...1,35
SVS max.	mm	: 2,2
XK	mm	: 20,2...22,2
XL	mm	: 11,9...15,3

Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 D1  
Edition : 12.12.86  
replaces : 4.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1050 R159-4  
Type number : 0 460 426 044

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5.9

Power k: 76  
Speed 1/mi: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
pressure bar : 207...210

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,6...4,0

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 4,2...4,8

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del. quantity cm<sup>3</sup>/  
1000H.: 83,0...84,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 22,0...28,0  
Full-load speed regulation:

Speed 1/min: 1125  
Del. quantity cm<sup>3</sup>/  
1000H.: 36,0...44,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 97,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,8...2,6  
mm: (1,5...2,9)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (3,1...4,5)  
3rd speed 1/min: 900  
TD travel mm: 4,6...5,4  
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 3,0...3,6  
2nd speed 1/min: 900  
Supply-pump  
pressure bar: 4,7...5,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1050

Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1175  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5  
3rd speed 1/min: 1125  
Del. quantity cm<sup>3</sup>/: 36,0...44,0  
1000H.: (35,0...45,0)  
4th speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/: 78,5...81,5  
1000H.: (77,0...83,0)  
5th speed 1/min: 900  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (80,5...86,5)  
6th speed 1/min: 750  
Del. quantity cm<sup>3</sup>/: 83,5...87,5  
1000H.: (81,8...89,2)  
7th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 84,0...88,0  
1000H.: (82,3...89,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 45,0...53,0  
1000H.: (44,0...54,0)  
2nd speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (20,0...30,0)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 97,0  
2nd speed 1/min: 200  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,2...5,5
MS	mm	: 1,4...1,6
SVS max.	mm	: 0,8
XK	mm	: 20,2...22,2
XL	mm	: 10,7...14,1

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L  
Edition : 10.12.86  
replaces : 1.85  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R173-3  
Type number : O 460 426 058

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA 5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
pressure bar : 207...210

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Charge press. hPa: 750  
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
Charge press. hPa: 750

Setting value bar: 4,1...4,7

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 91,0...92,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 66,0...67,0

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,5...26,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1100  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 64,5...70,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 97,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,8)  
2nd speed 1/min: 900  
Charge press. hPa: 750  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1050  
Charge press. hPa: 750  
TD travel mm: 2,7...3,3  
mm: (2,3...3,6)

Supply-pump pressure characteristic:

1st speed 1/min: 200

Charge press. hPa: 750

Supply-pump pressure bar: 1,1...1,7  
2nd speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump pressure bar: 3,6...4,2  
3rd speed 1/min: 1050  
Charge press. hPa: 750  
Supply-pump pressure bar: 4,8...4,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting point hPa: 400  
LDA stroke mm: 6,2  
Del. quantity cm<sup>3</sup>/  
1000H.: 82,5...83,5  
(80,0...86,0)

2nd speed 1/min: 1170  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,5

3rd speed 1/min: 1160  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...15

4th speed 1/min: 1120  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 0..15,0

5th speed 1/min: 1100  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (62,5...72,5)

6th speed 1/min: 1050  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (77,0...83,0)

7th speed 1/min: 900  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (84,0...90,0)

8th speed 1/min: 750  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (88,5...94,5)

9th speed 1/min: 500  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (100,3...107,7)

10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
1000H: (63,5...69,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (18,5...28,5)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 85,0

2nd speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,2...5,5  
MS mm : 1,4...1,6  
SVS max. mm : 1,2

Remarks:  
Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L1  
Edition : 10.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1250 R173-4  
Type number : 0 460 426 060

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA-5,9

Power k: 132  
Speed 1/mi: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 800  
Setting value mm: 1,4...1,8

Supply-pump pressure:

C20

Speed 1/min: 750  
Charge press. hPa: 800  
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 82,5...83,5  
Dispersion cm<sup>3</sup>/  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,0...38,0

Low-idle speed regulation:

Speed 1/min: 365  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H: 59,0...65,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 800  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
2nd speed 1/min: 750  
Charge press. hPa: 800  
TD travel mm: -  
mm: (0,9...2,3)  
3rd speed 1/min: 1050  
Charge press. hPa: 800  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 2,2...2,8  
 2nd speed 1/min: 1050  
 Charge press. hPa: 800  
 Supply-pump pressure bar: 4,4...5,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: -  
 Overflow quantity cm3/10s: 41...83  
 2nd speed 1/min: 1250  
 Charge press. hPa: 800  
 Overflow quantity cm3/10s: 55...138  
 2nd speed 1/min: 1250  
 Charge press. hPa: 800  
 Overflow quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting point hPa: 400  
 Del.quantity cm3/1000H.: 69,5...70,5  
 2nd speed 1/min: 1400  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 0...3,0  
 3rd speed 1/min: 1370  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 0...15,0  
 4th speed 1/min: 1340  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 0...15,0  
 5th speed 1/min: 1300  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: (57,0...67,0)  
 6th speed 1/min: 1250  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 76,0...79,0  
 7th speed 1/min: 1050  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 79,5...82,5  
 8th speed 1/min: 750  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: (78,0...84,0)  
 9th speed 1/min: 500  
 Charge press. hPa: 800  
 Del.quantity cm3/1000H.: 83,5...91,5

10th speed 1/min: 500  
 Charge press. hPa: -  
 Del.quantity cm3/1000H.: (34,5...40,5)

Zero delivery (stop):

Mech. shutoff:  
 Speed 1/min: -  
 Del.quantity cm3/1000H.: -

Electr. shutoff:  
 Speed 1/min: 375  
 Del.quantity cm3/1000H.: -

Idle delivery:

1st speed 1/min: 375  
 Del.quantity cm3/1000H.: (6,0...16,0)  
 2nd speed 1/min: 500  
 Del.quantity cm3/1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Del.quantity cm3/1000H.: -  
 ind. 1000H.: 60,0  
 2nd speed 1/min: 350  
 Del.quantity cm3/1000H.: -  
 ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
 K mm : -  
 KF mm : 5,1...5,4  
 MS mm : 1,3...1,55  
 XK mm : 20,2...22,2  
 XL mm : 11,9...15,3

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P  
Edition : 12.12.86  
replaces : 9.85  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1400 R159-15  
Type number : 0 460 426 064

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 69  
Speed 1/mi: 2800

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 850  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 850  
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000H.: 56,5...57,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1470  
Del. quantity cm3/  
1000H.: 32,0...38,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 850  
TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 1100  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,5...3,1  
2nd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83  
quantity cm3/10s: (26...98)

2nd speed 1/min: 1400  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1580  
Del. quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1520  
Del. quantity cm3/: 8,5...12,5  
1000H.: (7,5...13,5)  
4th speed 1/min: 1470  
Del. quantity cm3/: -  
1000H.: (30,0...40,0)  
5th speed 1/min: 1400  
Del. quantity cm3/: 53,5...56,5  
1000H.: (52,0...58,0)  
6th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (54,0...60,0)  
7th speed 1/min: 850  
Del. quantity cm3/: 52,5...56,5  
1000H.: (50,8...58,2)  
8th speed 1/min: 500  
Del. quantity cm3/: 39,0...47,0  
1000H.: (39,3...46,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm3/: 41,0...49,0  
1000H.: (40,0...50,0)  
2nd speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 450  
Del. quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H.: 60,0  
2nd speed 1/min: 400  
Del. quantity cm3/: -  
ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,4...1,6
SVS max.	mm	: 0,8
XK	mm	: 20,2...22,2
XL	mm	: 10,8...14,2

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 P1  
Edition : 16.10.86  
replaces : -  
Calibrating oil : ISO-4113  
Injection pump : VE 6/12F1250 R159-16  
Type number : 0 460 426 066  
Customer-specific information  
Customer : CUMMINS  
Engine : 6 BT-59

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
Inlet press., bar : 0.2  
Calibrating nozzle-holder  
assembly : 1 688 901 027  
Opening  
pressure bar : 250...253  
Perforated-plate  
diameter mm : 0.5  
Test inj. tubing : 1 680 750 017  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +/-0,02 (0,04)  
Injection-pump setting values  
Test specifications in parentheses  
Timing-device travel:  
Speed 1/min: 750  
Setting value mm: 3,4...3,8  
Supply-pump pressure:  
Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm3/  
1000H.: 68,5...69,5  
Dispersion cm3/: 4,0  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
Del.quantity cm3/  
1000H.: 20,5...29,5  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm3/  
1000H.: 52,0...58,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 1100  
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 1250  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del.quantity cm3/: -  
1000H.: 0...3,0  
3rd speed 1/min: 1390  
Del.quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1350  
Del.quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: (50,0...60,0)  
6th speed 1/min: 1250  
Del.quantity cm3/: 65,7...68,7  
1000H.: (64,2...70,2)  
7th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (66,0...72,0)  
8th speed 1/min: 750  
Del.quantity cm3/: 68,5...72,5  
1000H.: (67,5...73,5)  
9th speed 1/min: 500  
Del.quantity cm3/: 51,0...58,0  
1000H.: -

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm3/: -  
1000H.: (20,0...30,0)  
2nd speed 1/min: 375  
Del.quantity cm3/: 8,0...14,0  
1000H.: (6,0...16,0)  
3rd speed 1/min: 450  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H: 60,0  
2nd speed 1/min: 240  
Del.quantity cm3/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 0,9...1,15
SVS max.	mm	: 1,2
XK	mm	: 18,8...20,8
XL	mm	: 11,8...15,2

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S  
Edition : 11.12.86  
replaces : 10.85  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R225-4  
Type number : O 460 426 071

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 71,5...72,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm3/  
1000H.: 50,0...56,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,9...1,5  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: (26...98)

2nd speed 1/min: 1150  
Overflow quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1260  
Del.quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1220  
Del.quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1190  
Del.quantity cm3/: -  
1000H.: (48,0...58,0)  
6th speed 1/min: 1150  
Del.quantity cm3/: 66,5...69,5  
1000H.: (65,0...71,0)  
7th speed 1/min: 900  
Del.quantity cm3/: -  
1000H.: (69,0...75,0)  
8th speed 1/min: 750  
Del.quantity cm3/: 71,0...75,0  
1000H.: (69,3...76,7)  
9th speed 1/min: 500  
Del.quantity cm3/: 58,0...66,0  
1000H.: (58,3...65,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 240  
Del.quantity cm3/: -  
ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,4
MS	mm	:	0,9...1,1
SVS max.	mm	:	1,0
XK	mm	:	20,2...22,2
XL	mm	:	11,5...14,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S2  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R225-6  
Type number : 0 460 426 073

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm3/  
1000H.: 58,0...59,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0

Full-load speed regulation:

Speed 1/min: 1240  
Del.quantity cm3/  
1000H.: 42,5...48,5

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 1100  
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83  
cm3/10s: (26...98)  
2nd speed 1/min: 1200  
Overflow quantity cm3/10s: 55...138  
cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

D04

1st speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: 0...3,0  
3rd speed 1/min: 1270  
Del.quantity cm3/: 17,5...29,5  
1000H.: (18,5...28,5)  
4th speed 1/min: 1240  
Del.quantity cm3/: -  
1000H.: (40,5...50,5)  
5th speed 1/min: 1200  
Del.quantity cm3/: 56,0...59,0  
1000H.: (54,5...60,5)  
6th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (55,5...61,5)  
7th speed 1/min: 750  
Del.quantity cm3/: 56,0...60,0  
1000H.: (54,3...61,7)  
8th speed 1/min: 500  
Del.quantity cm3/: 48,5...56,5  
1000H.: (48,8...56,2)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm3/: 23,0...31,0  
1000H.: (22,0...32,0)  
2nd speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 500  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H.: 60,0  
2nd speed 1/min: 400  
Del.quantity cm3/: -  
ax. 1000H.: 50,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0



Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 1,6
XK	mm	: 20,2...22,2
XL	mm	: 11,1...14,5

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S3  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1050 R225-10  
Type number : 0 460 426 076

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 89  
Speed 1/mi: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000H.: 59,5...60,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Full-load speed regulation:

Speed 1/min: 1100  
Del. quantity cm3/  
1000H.: 42,0...48,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,4...2,2  
mm: (1,1...2,5)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,8...4,2)  
3rd speed 1/min: 1050  
TD travel mm: 5,5...6,3  
mm: (5,2...6,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,9...3,5  
2nd speed 1/min: 1050  
Supply-pump pressure bar: 5,3...5,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83  
(26...98)  
2nd speed 1/min: 1050

Overflow : 55..138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del. quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1160  
Del. quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1130  
Del. quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1100  
Del. quantity cm3/: 42,0...48,0  
1000H.: (40,0...50,0)  
6th speed 1/min: 1050  
Del. quantity cm3/: 57,2...60,2  
1000H.: (55,7...61,7)  
7th speed 1/min: 900  
Del. quantity cm3/: 58,6...61,6  
1000H.: (57,1...63,1)  
8th speed 1/min: 750  
Del. quantity cm3/: -  
1000H.: (57,0...63,0)  
9th speed 1/min: 500  
Del. quantity cm3/: 53,0...61,0  
1000H.: (53,3...60,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 375  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/: 17,0...26,0  
1000H.: (16,5...26,5)  
2nd speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 500  
Del. quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 300

Del. quantity cm3/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 1,6
XK	mm	: 18,8...20,8
XL	mm	: 12,1...15,5

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S4  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1000 R225-11  
Type number : 0 460 426 080

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-5,9

Power k: 65  
Speed 1/mi: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02$  (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1  
Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 47,5...48,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1050  
Del.quantity cm3/  
1000H.: 30,0...36,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 40,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,1...1,9  
mm: (0,8...2,2)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,8...4,5)  
3rd speed 1/min: 1000  
TD travel mm: 5,3...6,1  
mm: (5,0...6,4)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
3rd speed 1/min: 1000  
Supply-pump pressure bar: 4,5...5,1

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Oveflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1000  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: 0...2,0  
3rd speed 1/min: 1090  
Del.quantity cm3/: -  
1000H.: 0...15,0  
4th speed 1/min: 1060  
Del.quantity cm3/: -  
1000H.: 0...15,0  
5th speed 1/min: 1050  
Del.quantity cm3/: -  
1000H.: (28,0...38,0)  
6th speed 1/min: 1000  
Del.quantity cm3/: 44,5...47,5  
1000H.: (43,0...49,0)  
7th speed 1/min: 900  
Del.quantity cm3/: -  
1000H.: (45,0...51,0)  
8th speed 1/min: 750  
Del.quantity cm3/: 45,0...49,0  
1000H.: (43,3...50,7)  
9th speed 1/min: 500  
Del.quantity cm3/: 33,0...41,0  
1000H.: (33,3...40,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del.quantity cm3/: -  
ind. 1000H.: 45,0

2nd speed 1/min: 370  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 A  
Edition : 12.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R241  
Type number : 0 460 426 085

Customer-specific information  
Customer : PERKINS

Engine : T6.60

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1100  
Charge press. hPa: 1000



Setting value bar: 7,2...7,8

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 90,5...91,5  
Dispersion cm3/ : 3,5  
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 700  
Del. quantity cm3/  
1000H.: 80,5...81,5

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 13,0...17,0  
Dispersion cm3/ : 3,5  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H: 52,0...58,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 90,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950  
Charge press. hPa: 1000  
TD travel mm: 0,5...1,1  
mm: (0,1...1,5)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1300  
Charge press. hPa: 1000  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000  
Supply-pump pressure bar: 4,7...5,3  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump pressure bar: 8,0...8,6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 41...138  
(26...153)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Overflow quantity cm3/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm3/ : 86,5...87,5  
1000H.: (84,0...90,0)  
2nd speed 1/min: 1530  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: 0...3,0  
3rd speed 1/min: 1480  
Charge press. hPa: 1000  
Del. quantity cm3/ : 7,5...16,5  
1000H.: (7,0...17,0)  
4th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (50,0...60,0)  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm3/ : 81,0...84,0  
1000H.: (79,5...85,5)  
6th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (88,0...94,0)  
7th speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/ : 89,0...92  
1000H.: (86,8...94,2)  
8th speed 1/min: 700  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (77,3...84,7)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/ : 70,5...75,5  
1000H.: (69,3...76,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 1300  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (10,0..20,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4,0...10,0  
1000H.: (2,0...12,0)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 100,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 1,1..1,35
SVS max.	mm	: 1,3
XK	mm	: 17,0...19,0
XL	mm	: 10,5...13,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L2  
Edition : 10.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R173-5  
Type number : 0 460 426 086

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA-5,9 IND.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : ±0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Charge press. hPa: 1000  
Setting value mm: 1,9...2,3

Supply-pump pressure:

Speed 1/min: 900  
Charge press. hPa: 1000

Setting value bar: 4,4...5,0

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 81,5...82,5  
Dispersion cm<sup>3</sup>/ : 4,0  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 42,5...43,5

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 60,5...66,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (1,4...2,8)  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
TD travel mm: 2,5...3,3  
mm: (2,2...3,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2,7...3,3  
2nd speed 1/min: 1150  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5,5...6,1

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Oveflow : 41...83  
quantity cm<sup>3</sup>/10s: (267...98)  
2nd speed 1/min: 1150  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 400  
Del. quantity cm<sup>3</sup>/: 68,5...69,5  
1000H.: (66,0...72,0)  
2nd speed 1/min: 1280  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0  
3rd speed 1/min: 1260  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
4th speed 1/min: 1240  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
5th speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (58,5...68,5)  
6th speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 76,0...79,0  
1000H.: (74,5...80,5)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 79,5...82,5  
1000H.: (78,0...84,0)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (79,0...84,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 80,0...88,0  
1000H.: (80,3...87,3)  
10th speed 1/min: 500  
Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
1000H: (40,0...46,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 19,0...31,0  
1000H.: (20,0...30,0)  
2nd speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 70,0  
2nd speed 1/min: 280  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 2,4
XK	mm	: 18,8...20,8
XL	mm	: 11,6...15,0

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L3  
Edition : 10.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1050 R173-6  
Type number : 0 460 426 087

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA-5,9

Power k: 125  
Speed 1/mi: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 82,5...83,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 41,0...42,0  
Dispersion cm<sup>3</sup>/  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 59,0...65,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,9...2,3)  
3rd speed 1/min: 1050  
Charge press. hPa: 1000

TD travel mm: 2,1...2,9  
mm: (1,8...3,2)

#### Supply-pump pressure characteristic:

1st speed 1/min: 200  
Charge press. hPa: 1000  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4,5...5,1

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del. quantity cm<sup>3</sup>/: 70,5...71,5  
1000H.: (68,0...74,0)  
2nd speed 1/min: 1180  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0  
3rd speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
4th speed 1/min: 1120  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...15,0  
5th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (57,0...67,0)  
6th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 77,5...80,5  
1000H.: (76,0...82,0)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 78,0...81,0  
1000H.: (76,5...82,5)  
8th speed 1/min: 750

Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (80,0...86,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 80,5...88,5  
1000H.: (80,8...88,2)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (38,5...44,5)

#### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

#### Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

#### Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

#### Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 55,0  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 60,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

#### Mounting and assembly dimensions:

#### Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	2,0
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Correction at adjusting nut (46)





# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 A1  
Edition : 15.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1300 R241-1  
Type number : 0 460 426 088  
Customer-specific information  
Customer : PERKINS  
Engine : T6.60

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
Inlet press., bar : 0.2  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
Opening  
pressure bar : 172...175  
Perforated-plate  
diameter mm : 0.6  
Test inj. tubing : 1 680 750 017  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)  
Injection-pump setting values  
Test specifications in parentheses  
Timing-device travel:  
Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2,1...2,5  
Supply-pump pressure:  
Speed 1/min: 1100  
Charge press. hPa: 1000

Setting value bar: 7,2...7,8

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 83,0...84,0  
Dispersion cm<sup>3</sup>/ : 3,5  
1000H : (4,0)

Full-load del. w/out charge press.:

Speed 1/min : 700  
Del. quantity cm<sup>3</sup>/  
1000H.: 76,0...77,0

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 13,0...17,0  
Dispersion cm<sup>3</sup>/ : 3,5  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 52,0...58,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 88,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950  
Charge press. hPa: 1000  
TD travel mm: 0,5...1,1  
mm: (0,1...1,5)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1300  
Charge press. hPa: 1000  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000

Supply-pump  
pressure bar: 4,7...5,3  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 8,0...8,6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Overflow : 41...138  
quantity cm<sup>3</sup>/10s: (26...153)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 250  
Del. quantity cm<sup>3</sup>/ : 80,5...81,5  
1000H.: (78,0...84,0)  
2nd speed 1/min: 1530  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: 0...3,0  
3rd speed 1/min: 1480  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : 12,0...20,0  
1000H.: (11,0...21,0)  
4th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (50,0...60,0)  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : 74,0...77,0  
1000H.: (72,5...78,5)  
6th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (80,5...86,5)  
7th speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/ : 82,0...85,0  
1000H.: (79,8...87,2)  
8th speed 1/min: 700  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (72,8...80,2)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/ : 68,5...71,5  
1000H.: (66,3...73,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (10,0..20,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4,0...10,0  
1000H.: (2,0...12,0)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 100,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: K-0T
MS	mm	: 1,1..1,35
SVS max.	mm	: 1,3
XK	mm	: 17,0...19,0
XL	mm	: 10,5...13,9

Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 B  
Edition : 15.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1300 R247  
Type number : 0 460 426 090  
Customer-specific information  
Customer : PERKINS  
Engine : NA6.60

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
Inlet press., bar : 0.2  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
Opening  
pressure bar : 172...175  
Perforated-plate  
diameter mm : 0.6  
Test inj. tubing : 1 680 750 901  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
Start of delivery  
Prestroke mm : 0,5  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1100  
Setting value mm: 1,8...2,2

### Supply-pump pressure:

Speed 1/min: 1100  
Setting value bar: 5,2...5,8

### Full-load del. w/out charge press.:

Speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 76,5...77,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: 19,5...23,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

### Full-load speed regulation:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/  
1000H.: 44,5...50,5

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 80,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 950  
TD travel mm: 0,6...1,2  
mm: (0,2...1,6)  
2nd speed 1/min: 1100  
TD travel mm: -  
mm: (1,3...2,7)  
3rd speed 1/min: 1300  
TD travel mm: 2,8...3,6  
mm: (2,5...3,9)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,7...3,3  
2nd speed 1/min: 1300  
Supply-pump  
pressure bar: 6,1...6,7

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1300  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1530  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5  
3rd speed 1/min: 1480  
Del. quantity cm<sup>3</sup>/: 11,5...19,5  
1000H.: (10,5...20,5)  
4th speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (42,5...52,5)  
5th speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 68,5...71,5  
1000H.: (67,0...73,0)  
6th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (74,0...80,0)  
7th speed 1/min: 700  
Del. quantity cm<sup>3</sup>/: 71,8...74,2  
1000H.: (69,3...76,7)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 65,0...68,0  
1000H.: (62,8...70,2)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (16,5...26,5)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 4,5...10,5  
1000H.: (3,5...12,5)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 90,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

D25

Designation

K mm : -  
KF mm : K-0T  
MS mm : 1,2...1,45  
SVS max. mm : 2,2  
XK mm : 17,0...19,0  
XL mm : 10.6...14,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 B1  
Edition : 15.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R247-2  
Type number : O 460 426 097

Customer-specific information  
Customer : PERKINS

Engine : NA6.60

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,5  
(from BDC) : +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1100  
Setting value mm: 1,8...2,2

Supply-pump pressure:

Speed 1/min: 1100  
Setting value bar: 5,2...5,8

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 76,5...77,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: 19,5...23,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/  
1000H.: 44,5...50,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 80,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 950  
TD travel mm: 0,6...1,2  
mm: (0,2...1,6)  
2nd speed 1/min: 1100  
TD travel mm: -  
mm: (1,3...2,7)  
3rd speed 1/min: 1300  
TD travel mm: 2,8...3,6  
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,7...3,3  
2nd speed 1/min: 1300  
Supply-pump pressure bar: 6,1...6,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1300  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1530  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...2,5  
3rd speed 1/min: 1480  
Del. quantity cm<sup>3</sup>/  
1000H.: (10,5...20,5)  
4th speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/  
1000H.: (42,5...52,5)  
5th speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000H.: (68,5...71,5)  
6th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (74,0...80,0)  
7th speed 1/min: 700  
Del. quantity cm<sup>3</sup>/  
1000H.: (69,3...76,7)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: (62,8...70,2)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000H.:

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: (16,5...26,5)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: (3,5...12,5)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del. quantity cm<sup>3</sup>/  
ind. 1000H.: 90,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/  
ax. 1000H.: 60,0

Shutoff electromagnet:

Cut-in min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	K-0T
MS	mm	:	1,2...1,45
SVS max.	mm	:	2,2
XK	mm	:	17,0...19,0
XL	mm	:	10.6...14,0

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 6,5K2  
Edition : 16.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1200 R265  
Type number : 0 460 426 099

Customer-specific information  
Customer : STEYR

Engine : WD 612.61

Power k: 100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 800  
Setting value bar: 5,9...6,5

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 83,0...84,0

Dispersion cm<sup>3</sup>/: 3,5  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: 13,0...23,0  
Dispersion cm<sup>3</sup>/: 3,5  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000H.: 15,0...21,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 90,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,8...1,4  
mm: (0,4...1,8)  
2nd speed 1/min: 800  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1200  
TD travel mm: 2,8...3,6  
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 5,0...5,6  
2nd speed 1/min: 1200  
Supply-pump pressure bar: 7,6...8,2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1200  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1330  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

3rd speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (13,0...23,0)  
4th speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: 80,5...83,5  
1000H.: (79,0...85,0)  
5th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (80,5...86,5)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: 80,2...82,8  
1000H.: (78,3...85,2)  
7th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 76,5...79,5  
1000H.: (74,3...81,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (13,0...23,0)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 1,0...7,0  
1000H.: -  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 170  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 90,0  
2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 65,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,55  
SVS max. mm : 5,2

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L4  
Edition : 11.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R173-8  
Type number : 0 460 426 101

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA-5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1,4...1,8

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000

Setting value bar: 3,2...3,8

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 84,0...87,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 41....42,0

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 61,0...67,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,9...2,3)  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 2,3...3,1  
mm: (2,0...3,4)

Supply-pump pressure characteristic:

1st speed 1/min: 500

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4,3...4,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 450  
Del. quantity cm<sup>3</sup>/  
1000H.: (65,5...71,5)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...3,0  
3rd speed 1/min: 1370  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...15,0  
4th speed 1/min: 1330  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...15,0  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (59,0...69,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (73,5...79,5)  
7th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (79,0...85,0)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (81,5...87,5)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (84,8...92,2)  
10th speed 1/min: 500  
Charge press. hPa: -

Del. quantity cm<sup>3</sup>/: -  
1000H: (38,5...44,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)

2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0

2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 2,2
XK	mm	: 18,8...20,8
XL	mm	: 12,9...16,3

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,7 A  
Edition : 16.12.86  
replaces : 9.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/8F2300 R171  
Type number : 0 460 484 010

Customer-specific information  
Customer : PEUGEOT

Engine : XUD 7

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 4,3...4,9

Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del.quantity cm<sup>3</sup>/  
1000H.: 28,0...29,0  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...12,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm<sup>3</sup>/  
1000H.: 3,5...4,5

Full-load speed regulation:

Speed 1/min: 2400  
Del.quantity cm<sup>3</sup>/  
1000H.: 19,0...25,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm<sup>3</sup>/1000H.: 42,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 2000  
TD travel mm: 7,5...8,3  
mm: (7,2...8,6)

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3,0...3,6  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4,3...4,9  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6,4...7,0

Overflow quantity at overflow valve:

1st speed 1/min: 800

Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Del.quantity cm3/: -  
1000H.: 0...7,0  
3rd speed 1/min: 2500  
Del.quantity cm3/: 11,5...17,5  
1000H.: (10,5...18,5)  
4th speed 1/min: 2400  
Del.quantity cm3/: -  
1000H.: (18,0...26,0)  
5th speed 1/min: 2250  
Del.quantity cm3/: 27,0...29,0  
1000H.: (25,8...30,2)  
6th speed 1/min: 2000  
Del.quantity cm3/: 27,5...29,5  
1000H.: (26,3...30,7)  
7th speed 1/min: 1250  
Del.quantity cm3/: -  
1000H.: (26,3...30,7)  
8th speed 1/min: 800  
Del.quantity cm3/: 28,0...30,0  
1000H.: (26,8...31,2)  
9th speed 1/min: 500  
Del.quantity cm3/: 28,0...31,0  
1000H.: (26,5...32,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...14,0)

High Idle:  
Speed 1/min: 450  
Del.quantity cm3/: 8,0...12,0  
1000H.: (6,0...14,0)

Residual:  
Speed 1/min: 550  
Del.quantity : -  
1000H.: 0...8,0

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del.quantity cm3/: -  
ind. 1000H: 44,0

2nd speed 1/min: 300  
Del.quantity cm3/: -  
ax. 1000H: 34,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,2...5,5
MS	mm	: 1,3...1,5
SVS max.	mm	: 3,0
XK	mm	: 18,9...20,9
XL	mm	: 12,2...15,6

Setting of residual delivery.

Idle setting (LFG) according to  
VDT-I-460/135.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,3 A  
Edition : 02.04.87  
replaces : 4.86  
Calibrating oil : ISO 4113  
Injection pump : VE 4/8F2450 L212  
Type number : 0 460 484 011

Customer-specific information  
Customer : VW

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,5...4,9

### Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,4...6,0

### Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del.quantity cm3/  
1000H.: 23,5...24,5  
Dispersion cm3/: 2,0  
1000H.: (3,0)

### Low-idle speed regulation:

E09

Speed 1/min: 400  
Del.quantity cm3/  
1000H.: 14,5...16,5

Dispersion cm3/: 2,0  
1000H.: (3,0)

### Residual-Delivery Setting

Speed 1/min: 575  
Del.quantity cm3/  
1000H.: 2,5...3,5

### Full-load speed regulation:

Speed 1/min: 2600  
Del.quantity cm3/  
1000H.: 8,0...14,0

### Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 32,0

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 2,0...2,8  
mm: (1,7...3,1)

2nd speed 1/min: 1500  
TD travel mm: -  
mm: (4,0...5,4)

3rd speed 1/min: 2000  
TD travel mm: 6,9...7,7  
mm: (7,6...8,0)

4th speed 1/min: 2450  
TD travel mm: 8,6...9,4  
mm: (8,3...9,7)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,1...4,1

2nd speed 1/min: 2450  
Supply-pump  
pressure bar: 7,7...8,5

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 55...70  
quantity cm3/10s: (50...75)  
2nd speed 1/min: 2450  
Overflow : 82...112  
quantity cm3/10s: (77...117)

### Delivery-quant. and breakaway char.:



1st speed 1/min: 2800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...6,0  
3rd speed 1/min: 2550  
Del. quantity cm<sup>3</sup>/: 10,5...20,5  
1000H.: (9,5...21,5)  
4th speed 1/min: 2600  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (7,0...15,0)  
5th speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/: 19,0...21,0  
1000H.: (17,8...22,2)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (21,8...26,2)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 15,0...18,0  
1000H.: (13,5...19,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Electr. shutoff:  
Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (11,5...19,5)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 5,5...8,5  
1000H.: (3,0...11,0)

Residual:  
Speed 1/min: 525  
Del. quantity : 2,3...4,3  
1000H.: (0,8...5,8)

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 25,0  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 28,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

E10

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,5  
SVS max. mm : 4,9

Remarks:  
Setting of residual delivery.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,3H5  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/8F2000 R61-1  
Type number : 0 460 484 012  
  
Customer-specific information  
Customer : FIAT PANDA  
  
Engine : X8/29

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1600  
Setting value mm: 4,8...5,2

Supply-pump pressure:

Speed 1/min: 1600  
Setting value bar: 6,4...7,0

Full-load del. w/out charge press.:

Speed 1/min : 1200  
Del. quantity cm<sup>3</sup>/  
1000H.: 22,5...23,5  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 9,0...13,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -  
Full-load speed regulation:

Speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/  
1000H.: 11,5...18,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 28,0

Load-dependent start of delivery:

Speed 1/min: 1600

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,5...1,3  
mm: (0,2...1,6)  
2nd speed 1/min: 1600  
TD travel mm: -  
mm: (4,3...5,7)  
3rd speed 1/min: 2000  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,3...3,9  
2nd speed 1/min: 2000  
Supply-pump  
pressure bar: 7,7...8,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Oveflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2300

Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
3rd speed 1/min: 2150  
Del. quantity cm<sup>3</sup>/: 5,0...11,0  
1000H.: (4,0...12,0)  
4th speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (11,0...19,0)  
5th speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/: 18,2...20,8  
1000H.: (17,3...21,7)  
6th speed 1/min: 1600  
Del. quantity cm<sup>3</sup>/: 19,3...21,8  
1000H.: (18,3...22,7)  
7th speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (20,8...25,2)  
8th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 18,5...21,5  
1000H.: (17,0...23,0)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Electr. shutoff:  
Speed 1/min: 2000  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (7,0...15,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0  
3rd speed 1/min: 550  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 26,0  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 26,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 6,1...6,2
MS	mm	: 1,4...1,65
SVS max.	mm	: -

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,0 D  
Edition : 10.12.86  
replaces : 10.84  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R69  
Type number : O 460 494 055

Customer-specific information  
Customer : RENAULT

Engine : J 8 S-702

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/  
1000H.: 48,6...49,6  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,6...38,6

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 9,0...13,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 23,0...29,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 1,9...2,7  
mm: (1,6...3,0)  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 1800  
Charge press. hPa: 800  
TD travel mm: 5,7...6,5  
mm: (5,4...6,8)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: 800

Supply-pump  
pressure bar: 1,9...2,5  
2nd speed 1/min: 1800  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2200  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 200  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: 42,1...43,1  
mm: (39,6...44,8)  
2nd speed 1/min: 2700  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...2,0  
3rd speed 1/min: 2500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...17,5  
4th speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (22,0...30,0)  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 45,1...47,1  
mm: (43,9...48,3)  
6th speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (46,9...51,3)  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 45,6...48,6  
mm: (44,1...50,1)  
9th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (35,9...40,3)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/  
1000H.: -

Electr. shutoff:  
Speed 1/min: 2200  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 480  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
2nd speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 4,0...8,0  
1000H.: (2,0...10,0)  
3rd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (7,0...15,0)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0  
2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2-3,4  
KF mm : 5,7-5,9  
MS mm : 1,4-1,6  
SVS max. mm : 5,3  
XK mm : 20,2-22,2  
XL mm : 9,1-12,4

Correction at adjusting nut (46)  
emarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A  
Edition : 10.12.86  
replaces : 3.85  
Calibrating oil : ISO-4113  
  
Injection pump : VE 4/9F2250 R84  
Type number : 0 460 494 079  
  
Customer-specific information  
Customer : PEUGEOT  
  
Engine : XD3 505 D

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del. quantity cm3/  
1000H.: 38,5...39,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2325  
Del. quantity cm3/  
1000H.: 25,5...31,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 2000  
TD travel mm: 8,1...8,9  
mm: (7,8...9,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 2.1...2,7  
2nd speed 1/min: 2200  
Supply-pump  
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2550

Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...2,0  
 2nd speed 1/min: 2450  
 Del. quantity cm<sup>3</sup>/: 4,5...12,5  
 1000H.: (4,5...12,5)  
 3rd speed 1/min: 2325  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (24,5...32,5)  
 4th speed 1/min: 2200  
 Del. quantity cm<sup>3</sup>/: 39,0...41,0  
 1000H.: (37,8...42,2)  
 5th speed 1/min: 2000  
 Del. quantity cm<sup>3</sup>/: 38,5...40,5  
 1000H.: (37,3...41,7)  
 6th speed 1/min: 1250  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (36,8...41,2)  
 7th speed 1/min: 600  
 Del. quantity cm<sup>3</sup>/: 35,5...38,5  
 1000H.: (34,0...40,0)

Zero delivery (stop):

Mech. shutoff:  
 Speed 1/min: -  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.:

Electr. shutoff:  
 Speed 1/min: 2250  
 ELAB volt: -  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.:

Idle delivery:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (4,0...12,0)  
 2nd speed 1/min: 440  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H.: 45,0  
 2nd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: -  
 ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,2-5,4
MS	mm	: 0,9-1,2
SVS max.	mm	: 3,3
XK	mm	: 20,2-22,2
XL	mm	: 9,9-13,3

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 E  
Edition : 02.04.87  
replaces : 7.84  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2400 R95  
Type number : O 460 494 105

Customer-specific information  
Customer : RENAULT

Engine : F8M

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
Setting value mm: 4,1...4,5  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1400  
Setting value bar: 4,9...5,5  
KSB solenoid-operated  
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm<sup>3</sup>/  
1000H.: 28,5...29,5  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000H.: 6,0...10,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,0  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2550  
Del. quantity cm<sup>3</sup>/  
1000H.: 21,0...29,0  
KSB solenoid-operated  
valve volt: 12,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 42,0  
KSB solenoid-operated  
valve volt: 12,0

Load-dependent start of delivery:

Speed 1/min: 1400  
KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,7...1,5  
mm: (0,4...1,8)  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1000  
TD travel mm: 2,3...3,1  
mm: (2,0...3,4)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1400  
TD travel mm: -  
mm: (3,6...5,0)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 2000

TD travel mm: 6,3...7,1  
mm: (6,0...7,4)  
KSB solenoid-operated  
valve volt: 12,0  
5th speed 1/min: 2100  
TD travel mm: 6,7...7,5  
mm: (6,4...7,8)

KSB solenoid-operated  
valve volt: 12,0  
6th speed 1/min: 2400  
TD travel mm: 7,0...7,7  
mm: (6,6...8,0)  
KSB solenoid-operated  
valve volt: 12,0

Mfg. date: from : -  
1st speed 1/min: 300  
TD travel mm: 2,0...4,0  
mm: -

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 2,5...3,1  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 2400  
Supply-pump  
pressure bar: 7,7...8,3  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...70  
quantity cm<sup>3</sup>/10s: (50...75)  
2nd speed 1/min: 2400  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 82...112  
quantity cm<sup>3</sup>/10s: (77...118)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2850  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...7,0  
2nd speed 1/min: 2700  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 10,5...16,5  
1000H.: (9,5...17,5)  
3rd speed 1/min: 2550  
KSB solenoid-operated  
valve volt: 12,0

Del. quantity cm<sup>3</sup>/: 21,0...29,0  
1000H.: (21,0...29,0)  
4th speed 1/min: 2400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 29,7...32,3  
1000H.: (28,7...33,3)  
5th speed 1/min: 2100  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 20,3...32,7  
1000H.: (29,2...33,8)  
6th speed 1/min: 1400  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 27,8...29,8  
1000H.: (26,5...31,1)  
7th speed 1/min: 1000  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (26,7...31,3)  
8th speed 1/min: 600  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 26,9...29,9  
1000H.: (25,4...31,4)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: 3  
1000H.

Idle delivery:

1st speed 1/min: 425  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 600  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 0,5...5,5  
1000H.: (0...6,0)  
3rd speed 1/min: 650  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

E20

1st speed 1/min: 330  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 30,0

2nd speed 1/min: 500  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 31,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...5,9
MS	mm	: 1,2...1,4
SVS max.	mm	: 2,8
XK	mm	: 18,7...20,7
XL	mm	: 9,5...12,8

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3 K  
Edition : 3.10.86  
replaces : 9.85  
Calibrating oil : ISO-4113  
Injection pump : VE 4/9F2075 R126  
Type number : 0 460 494 121

Customer-specific information  
Customer : PEUGEOT

Engine : XD 3S

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 5,8-6,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value bar: 5,6-6,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/  
1000H.: 53,5-54,5  
Dispersion cm<sup>3</sup>/  
1000H : 2,5  
1000H : -

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 40,0-41,0

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,0-24,0  
Dispersion cm<sup>3</sup>/  
1000H.: 2,0  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,5-32,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 67,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 800  
TD travel mm: 0,8-1,6  
mm: (0,5-1,9)

2nd speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 2,5-3,3  
mm: (2,2-3,6)

3rd speed 1/min: 1500  
Charge press. hPa: 800  
TD travel mm: -  
mm: (5,3-6,7)

4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 7,8-8,6  
mm: (7,5-8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 1,4-2,0

2nd speed 1/min: 750  
Charge press. hPa: 800  
Supply-pump pressure bar: 3,4-4,0  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump pressure bar: 7,1-7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41-83  
2nd speed 1/min: 2075  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 55-138  
3rd speed 1/min: 2075  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: (40-153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/1000H.: 47,5-48,5  
2nd speed 1/min: 2600  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 0...1,0  
3rd speed 1/min: 2300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 26,5-32,5  
4th speed 1/min: 2200  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 39,5-45,5  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 52,0-54,0  
6th speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (51,8-56,2)  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 50,5-53,5  
8th speed 1/min: 750  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 41,5-44,5  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 40,0-41,0

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/1000H.: -

Electr. shutoff:  
Speed 1/min: 400  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000H.: (18,0-26,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/1000H.: 8,0-12,0  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 230  
Del. quantity cm<sup>3</sup>/1000H.: -  
2nd speed 1/min: 330  
Del. quantity cm<sup>3</sup>/1000H.: -

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : K1  
KF mm : 5,4-5,7  
MS mm : 1,2-1,4  
SVS max. mm : 4,6  
XK mm : 20,2-22,2  
XL mm : 9,7-13,1

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A  
Edition : 2.10.86  
replaces : 6.85  
Calibrating oil : ISO-4113  
Injection pump : VE 4/9F2400 R125  
Type number : 0 460 494 122  
Customer-specific information  
Customer : FORD-KENT  
Engine : 1,6L IDI

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
Inlet press., bar : 0.2  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
Opening  
pressure bar : 130...133  
Test inj. tubing : 1 680 750 073  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 5,0...5,4  
KSB solenoid-operated  
valve volt: 12,0

### Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,3...5,9  
KSB solenoid-operated  
valve volt: 12,0

### Full-load del. w/out charge press.:

Speed 1/min : 1750

Del. quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -

### Low-idle speed regulation:

Speed 1/min: 440  
Del. quantity cm<sup>3</sup>/  
1000H.: 7,0...11,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,0  
1000H.: -

### Full-load speed regulation:

Speed 1/min: 2675  
Del. quantity cm<sup>3</sup>/  
1000H.: 7,5...13,5  
KSB solenoid-operated  
valve volt: 12,0

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 50,0  
KSB solenoid-operated  
valve volt: 12,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,6...2,4  
mm: (1,3...2,7)  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (4,5...5,9)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 2000  
TD travel mm: 7,6...8,4  
mm: (7,3...8,7)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 600  
TD travel mm: 2,2...4,2  
mm: -  
KSB solenoid-operated  
valve volt: -

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3,1...3,7  
KSB solenoid-operated valve volt: 12,0  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,6...7,2  
KSB solenoid-operated valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600  
KSB solenoid-operated valve volt: 12,0  
Overflow quantity : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2400  
KSB solenoid-operated valve volt: 12,0  
Overflow quantity : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2950  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
2nd speed 1/min: 2675  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,5...14,5)  
3rd speed 1/min: 2550  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 18,5...26,5  
1000H.: (18,5...26,5)  
4th speed 1/min: 2400  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 28,1...30,1  
1000H.: (26,9...31,3)  
5th speed 1/min: 1750  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (27,8...32,2)  
6th speed 1/min: 1000  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 26,0...29,0  
1000H.: (25,3...29,7)  
7th speed 1/min: 600  
KSB solenoid-operated valve volt: 12,0

Del. quantity cm<sup>3</sup>/: 24,0...27,0  
1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 440  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,0...13,0)  
2nd speed 1/min: 475  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 2,5...7,5  
1000H.: (1,0...9,0)  
3rd speed 1/min: 570  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 400  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 30,0  
2nd speed 1/min: 500  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2-3,4  
KF mm : 5,7-6,0  
MS mm : 1,6-1,85  
SVS max. mm : 3,4  
XK mm : 23,3-25,3  
XL mm : 10,4-13,8

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3K3  
Edition : 3.10.86  
replaces : 9.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-1  
Type number : 0 460 494 123

Customer-specific information  
Customer : PEUGEOT

Engine : XD3S AUT.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800



Del. quantity cm<sup>3</sup>/  
1000H.: 53,5...54,5  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 40,0...41,0

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: 17,0...21,0  
Dispersion cm<sup>3</sup>/  
1000H.: 2,0

Full-load speed regulation:

Speed 1/min: 2350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,5...32,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 67,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 2,5...3,3  
mm: (2,2...3,6)  
3rd speed 1/min: 1500  
Charge press. hPa: 800  
TD travel mm: -  
mm: (5,3...6,7)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 7,8...8,6  
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 1,4...2,0

2nd speed 1/min: 750  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 3,4...4,0  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 2125  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: 47,5...48,5  
(45,8...50,2)  
2nd speed 1/min: 2650  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,0  
3rd speed 1/min: 2350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 25,5...33,5  
4th speed 1/min: 2250  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 38,5...44,5  
(37,5...45,5)  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 52,0...54,0  
(50,8...55,2)  
6th speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 51,8...56,2  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 50,5...53,5  
(49,8...54,2)  
8th speed 1/min: 750  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 41,5...44,5  
(40,8...45,2)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 38,3...42,7

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,0..23,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 5,0...9,0  
1000H.: (3,0...11,0)  
3rd speed 1/min: 550  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0  
2nd speed 1/min: 330  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,4...5,7
MS	mm	: 1,2...1,4
SVS max.	mm	: 4,6
XK	mm	: 20,2...22,2
XL	mm	: 9,4...12,8

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A 1  
Edition : 10.12.86  
replaces : 9.85  
Calibrating oil : ISO-4113  
  
Injection pump : VE 4/9F2250 R84-1  
Type number : 0 460 494 125  
  
Customer-specific information  
Customer : PEUGEOT  
  
Engine : XD3 505 D

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del. quantity cm3/  
1000H.: 38,5...39,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2325  
Del. quantity cm3/  
1000H.: 25,5...31,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 2000  
TD travel mm: 8,1...8,9  
mm: (7,8...9,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 2200  
Supply-pump  
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2550

Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
2nd speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/: 4,5...12,5  
1000H.: (4,5...12,5)  
3rd speed 1/min: 2325  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (24,5...32,5)  
4th speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/: 39,0...41,0  
1000H.: (37,8...42,2)  
5th speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/: 38,5...40,5  
1000H.: (37,3...41,7)  
6th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (36,8...41,2)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 35,5...38,5  
1000H.: (34,0...40,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.:

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 440  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 45,0  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 45,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : K1  
KF mm : 5,2-5,4  
MS mm : 0,9-1,2  
SVS max. mm : 3,3

F02

XK mm : 20,2-22,2  
XL mm : 9,9-13,3

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 E  
Edition : 16.12.86  
replaces : 9.85  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2300 R141  
Type number : 0 460 494 132

Customer-specific information  
Customer : FIAT

Engine : X8/43

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,2...30,2  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390  
Del. quantity cm3/  
1000H.: 9,0...13,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2500  
Del. quantity cm3/  
1000H.: 11,0...17,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 2300  
TD travel mm: 7,1...7,9  
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump pressure bar: 2,8...3,4  
2nd speed 1/min: 2300  
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow quantity cm3/10s: 41...83  
(26...98)  
2nd speed 1/min: 2300  
Overflow quantity cm3/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2600

F04

Del. quantity cm3/: 3,0...10,0  
1000H.: (2,5...10,5)  
3rd speed 1/min: 2500  
Del. quantity cm3/: -  
1000H.: (10,0...18,0)  
4th speed 1/min: 2400  
Del. quantity cm3/: 21,0...27,0  
1000H.: (20,0...28,0)  
5th speed 1/min: 2250  
Del. quantity cm3/: 31,0...33,4  
1000H.: (30,0...34,4)  
6th speed 1/min: 1500  
Del. quantity cm3/: -  
1000H.: (26,5...31,9)  
7th speed 1/min: 1000  
Del. quantity cm3/: 28,9...31,5  
1000H.: (28,0...32,4)  
8th speed 1/min: 600  
Del. quantity cm3/: 30,0...33,0  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 390  
Del. quantity cm3/: -  
1000H.: (7,0...15,0)  
2nd speed 1/min: 440  
Del. quantity cm3/: 1,0...7,0  
1000H.: (0...8,0)  
3rd speed 1/min: 500  
Del. quantity cm3/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm3/: -  
ind. 1000H: 45,0  
2nd speed 1/min: 400  
Del. quantity cm3/: -  
ax. 1000H: 46,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,1...3,4

KF	mm	: 5,7...6,0
MS	mm	: 1,7...1,9
SVS max.	mm	: 2,8
XK	mm	: 20,2...22,2
XL	mm	: 10,3...13,7

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 K  
Edition : 02.04.87  
replaces : 10.84  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2200 R153  
Type number : 0 460 494 141

Customer-specific information  
Customer : RENAULT

Engine : J8S-709

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800



Del. quantity cm<sup>3</sup>/  
1000H.: 48,2...49,2  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,6...38,6

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 9,0...13,0  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 23,0...29,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 1,9...2,7  
mm: (1,6...3,0)  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 1800  
Charge press. hPa: 800  
TD travel mm: 5,7...6,5  
mm: (5,4...6,8)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 2,7...3,2

2nd speed 1/min: 1800  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2000  
Charge press. hPa: 800  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 200  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: (39,0...45,0)  
2nd speed 1/min: 2700  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...3,0  
3rd speed 1/min: 2500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...17,5  
4th speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (22,0...30,0)  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (43,2...47,8)  
6th speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (46,4...51,0)  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (44,7...50,7)  
8th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (35,1...41,1)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/  
1000H.: -

Electr. shutoff:

Speed 1/min: 350  
ELAB volt: -  
Del.quantity cm<sup>3</sup>/: 3  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del.quantity cm<sup>3</sup>/: -  
1000H.: (7,0...15,0)  
2nd speed 1/min: 375  
Del.quantity cm<sup>3</sup>/: 4,0...8,0  
1000H.: (2,0...10,0)  
3rd speed 1/min: 480  
Del.quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0  
2nd speed 1/min: 300  
Del.quantity cm<sup>3</sup>/: -  
ax. 1000H: 40,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 17,0...19,0
XL	mm	: 10,3...13,7

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 D  
Edition : 16.12.86  
replaces : 3.84  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 L157  
Type number : 0 460 494 144

Customer-specific information  
Customer : FIAT

Engine : X8/48

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,1...5,7

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 33,0...34,0  
Dispersion cm3/  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm3/  
1000H.: 9,0...13,0  
Dispersion cm3/  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400  
Del. quantity cm3/  
1000H.: 24,0...30,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 57,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0,7...1,5  
mm: (0,4...1,8)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,9...5,3)  
3rd speed 1/min: 2300  
TD travel mm: 8,2...9,0  
mm: (7,9...9,3)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump  
pressure bar: 2,5...3,1  
2nd speed 1/min: 2300  
Supply-pump  
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: -

Del. quantity cm<sup>3</sup>/: -  
 1000H.: -  
 2nd speed 1/min: 2600  
 Del. quantity cm<sup>3</sup>/: 3,0...9,0  
 1000H.: (2,0...10,0)  
 3rd speed 1/min: 2500  
 Del. quantity cm<sup>3</sup>/: 14,0...20,0  
 1000H.: (13,0...21,0)  
 4th speed 1/min: 2400  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (23,0...31,0)  
 5th speed 1/min: 2300  
 Del. quantity cm<sup>3</sup>/: 34,8...37,2  
 1000H.: (33,8...38,2)  
 6th speed 1/min: 1500  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (31,3...35,7)  
 7th speed 1/min: 1000  
 Del. quantity cm<sup>3</sup>/: 32,7...35,3  
 1000H.: (31,8...36,2)  
 8th speed 1/min: 600  
 Del. quantity cm<sup>3</sup>/: 34,0...37,0  
 1000H.: (32,5...38,5)

Zero delivery (stop):

Mech. shutoff:  
 Speed 1/min: 2300  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.:

Idle delivery:

1st speed 1/min: 400  
 Del. quantity cm<sup>3</sup>/: 9,0...13,0  
 1000H.: (7,0...15,0)  
 2nd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0,5...6,5  
 1000H.: (0...7,5)  
 3rd speed 1/min: 500  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: 0...2,0

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H.: 50,0  
 2nd speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: -  
 ax. 1000H.: 46,0

Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

Mounting and assembly dimensions:

F10

Designation

K	mm	: 3,1...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,65
SVS max.	mm	: 2,8
XK	mm	: 25,0...27,0
XL	mm	: 9,2...12,6

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0F  
Edition : 02.04.87  
replaces : 9.85  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R158  
Type number : O 460 494 145

Customer-specific information  
Customer : RENAULT

Engine : J8S-706

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1400  
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 1400  
Del. quantity cm<sup>3</sup>/  
1000H.: 35,0...36,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/  
1000H.: 7,0...11,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/  
1000H.: 17,0...23,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1400

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 2,6...3,4  
mm: (1,3...3,7)  
2nd speed 1/min: 1400  
TD travel mm: -  
mm: (3,9...5,3)  
3rd speed 1/min: 2000  
TD travel mm: 6,7...7,5  
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...70  
2nd speed 1/min: 2200  
Overflow quantity cm<sup>3</sup>/10s: 82...112

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2550

Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...5,0  
3rd speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (16,0...24,0)  
4th speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/: 37,0...39,0  
1000H.: (35,7...40,3)  
5th speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/: 37,5...39,5  
1000H.: (36,2...40,8)  
6th speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (33,2...37,8)  
7th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 34,0...37,0  
1000H.: (33,2...37,8)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 3  
1000H.

Idle delivery:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,0...13,0)  
2nd speed 1/min: 650  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...5,0

Automatic starting fuel delivery:

1st speed 1/min: 370  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 45,0  
2nd speed 1/min: 480  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...5,9

MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 18,8...20,8
XL	mm	: 9,4...12,8

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W18  
Edition : 10.12.86  
replaces : 12.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2250 R170  
Type number : 0 460 494 152

Customer-specific information  
Customer : VW

Engine : 162 T -1,6L TURBO

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC) : +/-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value bar: 4,8...5,4

Full-load del. with charge press.:



Speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/  
1000H.: 42,5...43,5  
Dispersion cm3/ : 2,5  
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 600  
Del. quantity cm3/  
1000H.: 25,0...26,0

Low-idle speed regulation:

Speed 1/min: 415  
Charge press. hPa: 750  
Del. quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/ : 2,0  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm3/  
1000H: 13,0...19,0

Start:

Speed 1/min: 100  
Charge press. hPa: 750  
Del. quantity mind.  
cm3/1000H.: 35,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 900  
Charge press. hPa: 750  
TD travel mm: 1,6...2,4  
mm: (1,3...2,7)  
2nd speed 1/min: 1500  
Charge press. hPa: 750  
TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 2250  
Charge press. hPa: 750  
TD travel mm: 6,4...7,2  
mm: (6,1...7,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 750

Supply-pump pressure bar: 2,5...3,1  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Supply-pump pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: 750  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900  
Charge-air pressure-setting point hPa: 300  
Del. quantity cm3/ : 36,0...37,0  
1000H.: (34,3...38,7)  
2nd speed 1/min: 2650  
Charge press. hPa: 750  
Del. quantity cm3/ : -  
1000H.: 0...4,0  
3rd speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm3/ : 13,0...19,0  
1000H.: (12,0...20,0)  
4th speed 1/min: 2250  
Charge press. hPa: 750  
Del. quantity cm3/ : 35,0...37,0  
1000H.: (33,8...38,2)  
5th speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/ : -  
1000H.: (40,8...45,2)  
6th speed 1/min: 600  
Charge press. hPa: 750  
Del. quantity cm3/ : 34,8...37,8  
1000H.: (33,3...39,3)  
7th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (23,3...27,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/ : -  
1000H.

Electr. shutoff:

Speed 1/min: 400  
Del. quantity cm3/ : -  
1000H.

Idle delivery:

1st speed 1/min: 415  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 1000  
KSB solenoid-operated  
valve volt: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 400  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 29,5

2nd speed 1/min: 500  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 37,5

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : -  
KF mm : 5,7...6,0  
MS mm : 1,2...1,4

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,3K1  
Edition : 3.10.86  
replaces : 9.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2075 R126-2  
Type number : 0 460 494 155

Customer-specific information  
Customer : PEUGEOT

Engine : XD3S

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/  
1000H.: 53,5...54,5  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 40,0...41,0

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,0...24,0  
Dispersion cm<sup>3</sup>/  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,5...32,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 67,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 2,5...3,3  
mm: (2,2...3,6)  
3rd speed 1/min: 1500  
TD travel mm: -  
mm: (5,3...6,7)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 7,8...8,6  
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 1,4...2,0  
2nd speed 1/min: 750

Charge press. hPa: 800  
Supply-pump  
pressure bar: 3,4...4,0  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2075  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: (45,8...50,2)  
2nd speed 1/min: 2600  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,0  
3rd speed 1/min: 2300  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (25,5...33,5)  
4th speed 1/min: 2200  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (38,5...46,5)  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (50,8...55,2)  
6th speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (51,8...56,2)  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (49,8...54,2)  
8th speed 1/min: 750  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (40,8...45,2)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (32,3...42,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (18,0..26,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 8,0...12,0  
1000H.: (6,0...14,0)  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,0

Automatic starting fuel delivery:

1st speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0  
2nd speed 1/min: 330  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: K1
KF	mm	: 5,4...5,7
MS	mm	: 1,2...1,4
SVS max.	mm	: 4,6
XK	mm	: 20,2...22,2
XL	mm	: 9,7...13,1

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0 K1  
Edition : 02.04.87  
replaces : 10.84  
Calibrating oil : ISO-4113  
Injection pump : VE 4/9F2200 R153-1  
Type number : 0 460 494 156

Customer-specific information  
Customer : RENAULT

Engine : J 8 S-T01

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4,0...4,4

### Supply-pump pressure:

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value bar: 5,1...5,7

### Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/  
1000H.: 48,2...49,2  
Dispersion cm<sup>3</sup> / : 2,5  
1000H : -

### Full-load del. w/out charge press.:

Speed 1/min : 600  
Del. quantity cm<sup>3</sup>/  
1000H.: 37,6...38,6

### Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 9,0...13,0  
Dispersion cm<sup>3</sup> / : 2,5  
1000H.: -

### Full-load speed regulation:

Speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H: 23,0...29,0

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 1,9...2,7  
mm: (1,6...3,0)  
2nd speed 1/min: 1400  
Charge press. hPa: 800  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 1800  
Charge press. hPa: 800  
TD travel mm: 5,7...6,5  
mm: (5,4...6,8)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 6,2...7,0  
mm: (5,9...7,3)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 2,6...3,2

2nd speed 1/min: 1800  
Charge press. hPa: 800  
Supply-pump pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 2000  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 200  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/1000H.: 41,5...42,5

2nd speed 1/min: 2700  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 0...3,0

3rd speed 1/min: 2500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 0...17,5

4th speed 1/min: 2400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (22,0...30,0)

5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: 44,5...46,5

6th speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (43,2...47,8)

7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/1000H.: (44,9...49,3)

8th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: (35,1...41,1)

Zero delivery (stop):  
1000H.

Electr. shutoff:  
Speed 1/min: 350  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/1000H.: 3

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/1000H.: (7,0...15,0)  
2nd speed 1/min: 375  
Del. quantity cm<sup>3</sup>/1000H.: (4,0...8,0)  
3rd speed 1/min: 480  
Del. quantity cm<sup>3</sup>/1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del. quantity cm<sup>3</sup>/ind.: 1000H.: 40,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/ax.: 1000H.: 40,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,4...1,6  
SVS max. mm : 3,6  
XK mm : 17,0...19,0  
XL mm : 10,3...13,7

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWW 1,7 A  
Edition : 10.12.86  
replaces : 10.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2250 R187  
Type number : 0 460 494 164  
  
Customer-specific information  
Customer : VW  
  
Engine : 086-1,7LIT.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7

### Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 4,8...5,4

### Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del.quantity cm3/  
1000H.: 34,5...35,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 450  
Del.quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/: 2,0  
1000H.: (3,0)

### Full-load speed regulation:

Speed 1/min: 2450  
Del.quantity cm3/  
1000H.: 12,0...18,0

### Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 35,0

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 2,1...2,9  
mm: (1,8...3,2)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 2250  
TD travel mm: 7,4...8,2  
mm: (7,1...8,5)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 2,3...3,3  
2nd speed 1/min: 2250  
Supply-pump  
pressure bar: 6,5...7,5

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 55...70  
quantity cm3/10s: (50...75)  
2nd speed 1/min: 2250  
Overflow : 82...112  
quantity cm3/10s: (77...117)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2600  
Del.quantity cm3/: -  
1000H.: 0...6,0  
3rd speed 1/min: 2450



Del. quantity cm<sup>3</sup>/: -  
1000H.: (11,0...19,0)  
4th speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: 17,0...27,0  
1000H.: (16,0...28,0)  
5th speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/: 31,0...33,0  
1000H.: (29,8...34,2)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (32,8...37,2)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 23,5...26,5  
1000H.: (22,0...28,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0

Automatic starting fuel delivery:

1st speed 1/min: 360  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 35,0  
2nd speed 1/min: 560  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,5  
SVS max. mm : 4,8

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A1  
Edition : 3.10.86  
replaces : -  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F1800 R125-1  
Type number : D 460 494 168

Customer-specific information  
Customer : FORD-KENT

Engine : 1,6L IDI IND.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 5,0...5,4  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,3...5,9  
KSB solenoid-operated  
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm<sup>3</sup>/  
1000H.: 27,0...28,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 440  
Del. quantity cm<sup>3</sup>/  
1000H.: 7,0...11,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,0  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1850  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,0...26,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,6...2,4  
mm: (1,3...2,7)

KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (4,5...5,9)

KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 1750  
TD travel mm: 6,3...7,1  
mm: (6,0...7,4)

KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 600  
TD travel mm: 2,2...4,2  
mm: -

KSB solenoid-operated  
valve volt: -

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,1...3,7

KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1750  
Supply-pump  
pressure bar: 5,9...6,5  
KSB solenoid-operated  
valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1750  
KSB solenoid-operated  
valve volt: 12,0  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2050  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
2nd speed 1/min: 1910  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 7,5...15,5  
1000H.: (7,5...15,5)

3rd speed 1/min: 1850  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (19,0...27,0)

4th speed 1/min: 1750  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 29,0...31,0  
1000H.: (27,8...32,2)

5th speed 1/min: 1000  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (25,3...29,7)

6th speed 1/min: 600  
KSB solenoid-operated  
valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 24,0...27,0  
1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1800  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 440  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
1000H.: (5,0...13,0)  
2nd speed 1/min: 475  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: 2,5...7,5  
1000H.: (1,0...9,0)  
3rd speed 1/min: 570  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 400  
KSE solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ind. 1000H: 30,0  
2nd speed 1/min: 500  
KSB solenoid-operated  
valve volt: 12,0  
Del.quantity cm<sup>3</sup>/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2-3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,6..1,85
SVS max.	mm	: 3,4
XK	mm	: 23,3...25,3
XL	mm	: 10,4...13,8

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 H3  
Edition : 18.12.86  
replaces : 4.86  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 R207  
Type number : 0 460 494 170  
  
Customer-specific information  
Customer : FIAT-RITMO  
  
Engine : X8/34

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,1...4,5

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390  
Del.quantity cm3/  
1000H.: 10,0...14,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450  
Del.quantity cm3/  
1000H.: 19,0...25,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,6...2,4  
mm: (1,3...2,7)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,6...5,0)  
3rd speed 1/min: 2300  
TD travel mm: 7,0...7,8  
mm: (6,7...8,1)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3,1...3,7  
2nd speed 1/min: 2300  
Supply-pump pressure bar: 7,2...7,8

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm3/10s: 41...83  
2nd speed 1/min: 2300  
Overflow quantity cm3/10s: 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2900

Del.quantity cm3/: -  
1000H.: 0...1,5  
3rd speed 1/min: 2650  
Del.quantity cm3/: 2,0...9,0  
1000H.: (1,5...9,5)  
4th speed 1/min: 2450  
Del.quantity cm3/: -  
1000H.: (18,0...26,0)  
5th speed 1/min: 2300  
Del.quantity cm3/: 31,8...34,2  
1000H.: (30,8...35,2)  
6th speed 1/min: 1500  
Del.quantity cm3/: -  
1000H.: (27,8...32,2)  
7th speed 1/min: 1000  
Del.quantity cm3/: 29,8...32,2  
1000H.: (28,7...33,3)  
8th speed 1/min: 600  
Del.quantity cm3/: 30,0...33,0  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del.quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 390  
Del.quantity cm3/: -  
1000H.: (8,0...16,0)  
2nd speed 1/min: 440  
Del.quantity cm3/: 1,0...7,0  
1000H.: (0...8,0)  
3rd speed 1/min: 500  
Del.quantity cm3/: -  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del.quantity cm3/: -  
ind. 1000H.: 48,0  
2nd speed 1/min: 400  
Del.quantity cm3/: -  
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation K mm : 3,2...3,4

KF mm : 5,7...5,9  
MS mm : 1,7...1,9  
SVS max. mm : 2,8

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 X2  
Edition : 02.04.87  
replaces : 4,86  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2250 R211  
Type number : O 460 494 172

Customer-specific information  
Customer : VW

Engine : O86-1,6LIT.LLK

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 000

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value bar: 4,9...5,5

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750



Del. quantity cm<sup>3</sup>/  
1000H.: 41,5...42,5  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 34,3...37,3

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: -

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 13,0...19,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 35,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 750  
TD travel mm: 1,8...2,6  
mm: (1,5...2,9)  
2nd speed 1/min: 1500  
Charge press. hPa: 750  
TD travel mm: -  
mm: (3,3...4,3)  
3rd speed 1/min: 1800  
Charge press. hPa: 750  
TD travel mm: 4,8...5,6  
mm: (4,5...5,9)  
4th speed 1/min: 2250  
Charge press. hPa: 750  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 750  
Supply-pump pressure bar: 2,0...2,6  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Supply-pump pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 55...70  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Overflow quantity cm<sup>3</sup>/10s: 82...112  
quantity cm<sup>3</sup>/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 6,0  
Del. quantity cm<sup>3</sup>/  
1000H.: 32,5...33,5  
(30,0...36,0)  
2nd speed 1/min: 2700  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...4,0  
3rd speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (12,0...20,0)  
4th speed 1/min: 2425  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 25,0...35,0  
(24,0...36,0)  
5th speed 1/min: 2250  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 35,5...37,5  
(34,3...38,7)  
6th speed 1/min: 1500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (33,6...38,0)  
7th speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: (39,8...44,2)  
8th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 23,5...24,5  
(21,0...27,0)  
9th speed 1/min: 500  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 31,0...34,0  
(19,5...35,5)

## Zero delivery (stop):

## Mech. shutoff:

Speed 1/min: -  
 Del. quantity cm<sup>3</sup>/: -  
 1000H. 1000H.

## Electr. shutoff:

Speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: -  
 1000H. 1000H.

## Idle delivery:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: -  
 1000H.: (7,5...18,5)  
 2nd speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 5,0...9,0  
 1000H.: (1,5...12,5)

## High Idle:

Speed 1/min: 525  
 Del. quantity cm<sup>3</sup>/: 7,0...9,0  
 1000H.: (3,0...13,0)

## Residual:

Speed 1/min: 500  
 Del. quantity : 2,7...4,7  
 1000H.: (0,2...7,2)

## Automatic starting fuel delivery:

1st speed 1/min: 150  
 Del. quantity cm<sup>3</sup>/: -  
 ind. 1000H: 35,0

2nd speed 1/min: 350  
 Del. quantity cm<sup>3</sup>/: -  
 ax. 1000H: 30,0

## Shutoff electromagnet:

Cut-in  
 min. voltage : 10,0  
 Rated voltage : 12,0

## Mounting and assembly dimensions:

## Designation

K mm : K1  
 KF mm : 5,7...6,0  
 MS mm : 1,2...1,4  
 SVS max. mm : 2,7

## Setting of residual delivery.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F 2,5 M  
Edition : 15.12.86  
replaces : 6.86  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2100 R214  
Type number : 0 460 494 173  
  
Customer-specific information  
Customer : S0FIM  
  
Engine : 8144.67.2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1100  
Setting value mm: 3,5...3,9

### Supply-pump pressure:

Speed 1/min: 1100  
Setting value bar: 4,7...5,3

### Full-load del. w/out charge press.:

Speed 1/min : 1100

G05

Del. quantity cm<sup>3</sup>/  
1000H.: 41,5...42,5  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: 11,0...15,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

### Full-load speed regulation:

Speed 1/min: 2410  
Del. quantity cm<sup>3</sup>/  
1000H.: 19,0...25,0

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 60,0

### Load-dependent start of delivery:

Speed 1/min: 1100

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1100  
TD travel mm: -  
mm: (3,0...4,4)  
3rd speed 1/min: 2000  
TD travel mm: 8,6...9,4  
mm: (8,3...9,7)

### Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 3,5...4,1  
2nd speed 1/min: 2000  
Supply-pump  
pressure bar: 7,0...7,6

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2100

Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2610  
Del. quantity cm3/: -  
1000H.: 0...3,0  
3rd speed 1/min: 2510  
Del. quantity cm3/: 6,5...13,5  
1000H.: (6,0...14,0)  
4th speed 1/min: 2410  
Del. quantity cm3/: -  
1000H.: (18,0...26,0)  
5th speed 1/min: 2100  
Del. quantity cm3/: 41,9...44,9  
1000H.: (41,2...45,6)  
6th speed 1/min: 2000  
Del. quantity cm3/: 42,0...45,0  
1000H.: (41,3...45,7)  
7th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (39,8...44,2)  
8th speed 1/min: 600  
Del. quantity cm3/: 36,0...39,0  
1000H.: (34,5...40,5)

Zero delivery (stop):

Mech. shutoff: -  
Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 2100  
ELAB volt: -  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm3/: -  
1000H.: (9,0...17,0)  
2nd speed 1/min: 450  
Del. quantity cm3/: 2,0...8,0  
1000H.: (1,0...9,0)  
3rd speed 1/min: 700  
Del. quantity cm3/: 1,5...7,5  
1000H.: (0,5...8,5)  
4th speed 1/min: 1000  
Del. quantity cm3/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm3/: -  
ind. 1000H: 55,0

2nd speed 1/min: 400  
Del. quantity cm3/: -  
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,2...5,5
MS	mm	:	1,7...1,9
SVS max.	mm	:	4,3

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 D  
Edition : 3.10.86  
replaces : 9.85  
Calibrating oil : ISO-4113

Injection pump : VE 4/9F2125 R126-3  
Type number : 0 460 494 178

Customer-specific information  
Customer : PEUGEOT

Engine : XD 3T

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 5,8...6,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/  
1000H.: 53,5...54,5  
Dispersion cm<sup>3</sup>/  
1000H.: 2,5

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 40,0...41,00

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: 17,0...21,0  
Dispersion cm<sup>3</sup>/  
1000H.: 2,0

Full-load speed regulation:

Speed 1/min: 2350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,5...32,5

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 67,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 800  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 2,5...3,3  
mm: (2,2...3,6)  
3rd speed 1/min: 1500  
Charge press. hPa: 800  
TD travel mm: -  
mm: (5,3...6,7)  
4th speed 1/min: 2000  
Charge press. hPa: 800  
TD travel mm: 7,8...8,6  
mm: (7,5...8,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 1,4...2,0

2nd speed 1/min: 750  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 3,4...4,0  
3rd speed 1/min: 2000  
Charge press. hPa: 800  
Supply-pump  
pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 2125  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/  
1000H.: 47,5...48,5  
(45,8...50,2)  
2nd speed 1/min: 2650  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,0  
3rd speed 1/min: 2350  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 26,5...32,5  
(25,5...33,5)  
4th speed 1/min: 2250  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 38,5...44,5  
(37,5...45,5)  
5th speed 1/min: 2000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 52,0...54,0  
(50,8...55,2)  
6th speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: (51,8...56,2)  
7th speed 1/min: 1000  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 50,5...53,5  
(49,8...54,2)  
8th speed 1/min: 750  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 41,5...44,5  
(40,8...45,2)  
9th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (38,3...42,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2125  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,0...23,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 5,0...9,0  
1000H.: (3,0...11,0)  
3rd speed 1/min: 550  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,5

Automatic starting fuel delivery:

1st speed 1/min: 230  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 60,0  
2nd speed 1/min: 330  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	n.n	: K1
KF	mm	: 5,2...5,4
MS	mm	: 1,2...1,4
SVS max.	mm	: 5,5
XK	mm	: 20,2...22,2
XL	mm	: 9,4...12,8

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWW1,6 W17  
Edition : 8.12.86  
replaces : 12.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2400 R221  
Type number : 0 460 494 179

Customer-specific information  
Customer : VW

Engine : 086-1,6 LIT.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del.quantity cm3/  
1000H.: 31,5...32,5  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 12,0...14,0  
Dispersion cm3/ : 2,0  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm3/  
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600  
Del.quantity cm3/  
1000H.: 11,0...17,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1800  
TD travel mm: 4,2...5,0  
mm: (3,9...5,3)  
4th speed 1/min: 2400  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 2400  
Supply-pump  
pressure bar: 7,3...7,9

Overflow quantity at overflow valve:

1st speed 1/min: 600



Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2400  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...4,0  
3rd speed 1/min: 2600  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (10,0...18,0)  
4th speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/: 19,0...29,0  
1000H.: (20,0...28,0)  
5th speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: 26,7...28,7  
1000H.: (25,5...30,1)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (29,7...34,3)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 20,2...23,2  
1000H.: (18,7...24,7)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

Electr. shutoff:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (9,0...17,0)  
2nd speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 5,5...8,5  
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525  
Del. quantity cm<sup>3</sup>/: 7,0...9,0  
1000H.: -

Residual:

Speed 1/min: 500  
Del. quantity : 2,5...4,5  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cr<sup>3</sup>/: -  
ind. 1000H.: 35,0

2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,5  
XK mm : 17,0...19,0  
XL mm : 9,8...13,2

Setting of residual delivery.  
emarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W15  
Edition : 8.12.86  
replaces : 12.85  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2400 R224  
Type number : 0 460 494 185

Customer-specific information  
Customer : VW

Engine : 086-1,6 LIT.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 2,1...2,5

### Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 4,0...4,6

### Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 31,5...32,5  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,5...3,5

### Full-load speed regulation:

Speed 1/min: 2600  
Del. quantity cm<sup>3</sup>/  
1000H.: 11,0...17,0

### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 35,0

### Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1800  
TD travel mm: 4,2...5,0  
mm: (3,9...5,3)  
4th speed 1/min: 2400  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 2400  
Supply-pump  
pressure bar: 7,3...7,9

### Overflow quantity at overflow valve:

1st speed 1/min: 600

Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2400  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Del. quantity cm3/: -  
1000H.: 0...4,0  
3rd speed 1/min: 2600  
Del. quantity cm3/: -  
1000H.: (10,0...18,0)  
4th speed 1/min: 2500  
Del. quantity cm3/: 19,0...29,0  
1000H.: (20,0...28,0)  
5th speed 1/min: 2400  
Del. quantity cm3/: 26,7...28,7  
1000H.: (25,5...30,1)  
6th speed 1/min: 1500  
Del. quantity cm3/: -  
1000H.: (29,7...34,3)  
7th speed 1/min: 600  
Del. quantity cm3/: 20,2...23,2  
1000H.: (19,4...24,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 400  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (9,0...17,0)  
2nd speed 1/min: 425  
Del. quantity cm3/: 5,5...8,5  
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525  
Del. quantity cm3/: 7,0...9,0  
1000H.: -

Residual:

Speed 1/min: 500  
Del. quantity : 2,5...4,5  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cm3/: -  
ind. 1000H: 35,0

2nd speed 1/min: 350  
Del. quantity cm3/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,5  
SVS max. mm : 3,2  
XK mm : 17,0...19,0  
XL mm : 9,8...13,2

Setting of residual delivery.  
emarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FOR 1,6 A2  
Edition : 3.10.86  
replaces : -  
Calibrating oil : ISO-4113  
Injection pump : VE 4/9F2400 R125-2  
Type number : 0 460 494 186

Customer-specific information  
Customer : FORD-KENT

Engine : 1,6L. IDI IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7  
KSB solenoid-operated  
valve volt: 12,0

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,3...5,9  
KSB solenoid-operated  
valve volt: 12,0

Full-load del. w/out charge press.:

Speed 1/min : 1750

Del.quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 440  
Del.quantity cm<sup>3</sup>/  
1000H.: 7,0...11,0  
KSB solenoid-operated  
valve volt: 12,0  
Dispersion cm<sup>3</sup>/: 2,0  
1000H.: -

Full-load speed regulation:

Speed 1/min: 2675  
Del.quantity cm<sup>3</sup>/  
1000H.: 7,5...13,5  
KSB solenoid-operated  
valve volt: 12,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm<sup>3</sup>/1000H.: 50,0  
KSB solenoid-operated  
valve volt: 12,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1,3...2,1  
KSB solenoid-operated  
valve volt: 12,0  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
KSB solenoid-operated  
valve volt: 12,0  
3rd speed 1/min: 2000  
TD travel mm: 6,8...7,6  
mm: (6,5...7,9)  
KSB solenoid-operated  
valve volt: 12,0  
4th speed 1/min: 600  
TD travel mm: 2,2...4,2  
mm: -  
KSB solenoid-operated  
valve volt: -

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3,0...3,6  
KSB solenoid-operated valve volt: 12,0  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,6...7,2  
KSB solenoid-operated valve volt: 12,0

Overflow quantity at overflow valve:

1st speed 1/min: 600  
KSB solenoid-operated valve volt: 12,0  
Overflow quantity : 41...8,3  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2400  
KSB solenoid-operated valve volt: 12,0  
Overflow quantity : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2950  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...2,0  
2nd speed 1/min: 2675  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,5...14,5)  
3rd speed 1/min: 2550  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 18,5...26,5  
1000H.: (18,5...26,5)  
4th speed 1/min: 2400  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 28,1...30,1  
1000H.: (26,9...31,3)  
5th speed 1/min: 1750  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (27,8...32,2)  
6th speed 1/min: 1000  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 26,0...29,0  
1000H.: (25,3...29,7)  
7th speed 1/min: 600  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 24,0...27,0  
1000H.: (22,5...28,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 440  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,0...13,0)  
2nd speed 1/min: 475  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 2,5...7,5  
1000H.: (1,0...9,0)  
3rd speed 1/min: 570  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,5

Arrangement of drivers on engine-speed lever for exhaust-gas-recirculation valve linkage (guage)

1st speed 1/min: 1100  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: 12,0...13,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 30,0

2nd speed 1/min: 500  
KSB solenoid-operated valve volt: 12,0  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2-3,4

KF mm : 5,7-6,0  
MS mm : 1,6-1,85

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : Ve 4/9F2100 R234  
Type number : 0 460 494 187

Customer-specific information  
Customer : FIAT REGATA

Engine : X8/45

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 5,6...6,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/  
1000H.: 47,5...48,5  
Dispersion cm<sup>3</sup> : 2,5  
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 34,8...35,8

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 16,0...20,0  
Dispersion cm<sup>3</sup>: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 15,0...21,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 57,0

Load-dependent start of delivery:

Speed 1/min: 1500  
Charge press. hPa: -

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (4,4...5,8)  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
TD travel mm: 7,4...8,2  
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 2,2...2,8  
2nd speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3,5...4,1  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7,0...7,6

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2100  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 300  
Del. quantity cm3/: 39,5...40,5  
1000H.: (37,8...40,2)  
2nd speed 1/min: 2550  
Charge press. hPa: 1000  
Del. quantity cm3/: -  
1000H.: 0...7,0  
3rd speed 1/min: 2400  
Charge press. hPa: 1000  
Del. quantity cm3/: -  
1000H.: (14,0...22,0)  
4th speed 1/min: 2300  
Charge press. hPa: 1000  
Del. quantity cm3/: 25,5...32,5  
1000H.: (25,0...33,0)  
5th speed 1/min: 2100  
Charge press. hPa: 1000  
Del. quantity cm3/: 46,5...49,5  
1000H.: (45,8...50,2)  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/: -  
1000H.: (45,8...50,2)  
7th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm3/: 49,5...52,5  
1000H.: (48,8...53,2)  
8th speed 1/min: 800  
Charge press. hPa: -  
Del. quantity cm3/: -  
1000H.: (33,1...37,5)  
9th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm3/: 34,6...37,0  
1000H.: (32,8...38,8)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2100  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm3/: -  
1000H.: (14,0...22,0)  
2nd speed 1/min: 400  
Del. quantity cm3/: 4,5...10,5  
1000H.: (3,5...11,5)  
3rd speed 1/min: 500  
Del. quantity cm3/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm3/: -  
ind. 1000H.: 55,0  
2nd speed 1/min: 500  
Del. quantity cm3/: -  
ax. 1000H.: 40,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4...1,65
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 10,6...14,0

Correction at adjusting nut (46)



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 F  
Edition : 16.12.86  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/9F2300 R237  
Type number : 0 460 494 188

Customer-specific information  
Customer : PEUGEOT

Engine : XUD 9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 3,2...3,6

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del. quantity cm<sup>3</sup>/  
1000H.: 30,0...31,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,5...10,5  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,5...3,5  
Full-load speed regulation:

Speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/  
1000H.: 20,0...26,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 44,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (2,7...4,1)  
3rd speed 1/min: 2000  
TD travel mm: 6,4...7,2  
mm: (6,1...7,5)

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 2,5...3,1  
2nd speed 1/min: 2000  
Supply-pump  
pressure bar: 5,7...6,3

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2300

Overflow : 55..138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Del. quantity cm3/: -  
1000H.: 0...7,0  
3rd speed 1/min: 2500  
Del. quantity cm3/: 10,0...16,0  
1000H.: (9,0...17,0)  
4th speed 1/min: 2400  
Del. quantity cm3/: -  
1000H.: (19,0...27,0)  
5th speed 1/min: 2250  
Del. quantity cm3/: 30,5...32,5  
1000H.: (29,3...33,7)  
6th speed 1/min: 2000  
Del. quantity cm3/: 32,0...34,0  
1000H.: (30,8...35,2)  
7th speed 1/min: 1250  
Del. quantity cm3/: -  
1000H.: (28,3...32,7)  
8th speed 1/min: 700  
Del. quantity cm3/: 30,0...33,0  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300  
Del. quantity cm3/: -  
1000H.:

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (5,5...13,5)

High Idle:

Speed 1/min: 470  
Del. quantity cm3/: 8,0...10,0  
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550  
Del. quantity : -  
1000H.: 0...7,0

Arrangement of drivers on engine-speed lever for exhaust-gas-recirculation valve linkage (guage)

1st speed 1/min: 1125  
Del. quantity cm3/: 18,0...20,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cm3/: -  
ind. 1000H: 40,0

2nd speed 1/min: 300  
Del. quantity cm3/: -  
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,55  
SVS max. mm : -

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 N  
Edition : 19.12.86  
replaces : 4.86  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2100 R22-7  
Type number : 0 460 494 189

Customer-specific information  
Customer : SOFIM

Engine : 8144.67.220

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1800  
Setting value mm: 7,6...8,0

Supply-pump pressure:

Speed 1/min: 1800  
Setting value bar: 6,3...6,9

Full-load del. w/out charge press.:

Speed 1/min : 1000

Del. quantity cm<sup>3</sup>/  
1000H.: 36,9...37,9  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

#### Low-idle speed regulation:

Speed 1/min: 370  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...12,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

#### Full-load speed regulation:

Speed 1/min: 2350  
Del. quantity cm<sup>3</sup>/  
1000H.: 18,5...24,5

#### Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 55,0

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1800  
TD travel mm: -  
mm: (7,1...8,5)  
3rd speed 1/min: 2000  
TD travel mm: 8,3...9,1  
mm: (8,0...9,4)

#### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3,2...3,8  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,7...6,3

#### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2100  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
cm<sup>3</sup>/10s: (40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 2500

Del. quantity cm<sup>3</sup>/  
1000H.: 0...4,5  
3rd speed 1/min: 2350  
Del. quantity cm<sup>3</sup>/  
1000H.: (17,5...25,5)  
4th speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/  
1000H.: (36,1...38,7)  
5th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (35,1...39,7)  
6th speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000H.: (42,5...45,5)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: (41,7...46,3)  
Del. quantity cm<sup>3</sup>/  
1000H.: (32,8...38,8)

#### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2100  
Del. quantity cm<sup>3</sup>/  
1000H.:

#### Idle delivery:

1st speed 1/min: 370  
Del. quantity cm<sup>3</sup>/  
1000H.: (6,0...14,0)  
2nd speed 1/min: 420  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...1,5  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...3,0

#### Automatic starting fuel delivery:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
ind. 1000H.: 37,0  
2nd speed 1/min: 480  
Timing valve volt: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 32,0...38,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

#### Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,4...5,7  
MS mm : 1,7...1,9

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P1  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2400 R242  
Type number : 0 460 494 193

Customer-specific information  
Customer : FIAT

Engine : X8/57

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4,9...5,3

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value bar: 5,5...6,1

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/  
1000H.: 35,5...36,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,0

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 25,3...26,3

Low-idle speed regulation:

Speed 1/min: 350  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...18,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2650  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 17,0...23,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 48,0

Load-dependent start of delivery:

Speed 1/min: 1500  
Charge press. hPa: -

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (4,4...5,8)  
3rd speed 1/min: 2400  
Charge press. hPa: 1000  
TD travel mm: 8,5...9,3  
mm: (8,2...9,6)

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 1000

Supply-pump  
pressure bar: 3,6...4,2  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5,5...6,1  
4th speed 1/min: 2400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7,6...8,2

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2400  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1100  
Charge-air pressure-setting  
point hPa: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: (27,8...32,2)  
2nd speed 1/min: 2850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...6,0  
3rd speed 1/min: 2650  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (16,0...24,0)  
5th speed 1/min: 2400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (32,5...40,5)  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (33,8...38,2)  
7th speed 1/min: 1100  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (23,3...27,7)  
8th speed 1/min: 750  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: (22,8...28,8)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/  
1000H.: -

Idle delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (11,0..19,0)  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 4,0...8,0  
1000H.: (2,0...10,0)  
3rd speed 1/min: 520  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...3,0

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 34,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,4..1,65
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 9,1...12,5

Correction at adjusting nut (46)



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 D  
Edition : 02.04.87  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/9F2300 R162-1  
Type number : 0 460 494 195

Customer-specific information  
Customer : PEUGEOT

Engine : XUD9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C /  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 3,2...3,6

### Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 3,9...4,5

### Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del.quantity cm3/  
1000H.: 29,5...30,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,5...10,5  
Dispersion cm3/: 2,0  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm3/  
1000H.: 2,5...3,5  
Full-load speed regulation:

Speed 1/min: 2400  
Del.quantity cm3/  
1000H: 20,0...26,0

### Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 44,0

### Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0,7...1,5  
mm: (0,4...1,8)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (2,7...4,1)  
3rd speed 1/min: 2000  
TD travel mm: 7,5...8,3  
mm: (7,2...8,6)

### Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 2000  
Supply-pump  
pressure bar: 5,9...6,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300

Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...7,0  
3rd speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/: 11,5...17,5  
1000H.: (10,5...18,5)  
4th speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (19,0...27,0)  
5th speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/: 31,0...33,0  
1000H.: (29,8...34,2)  
6th speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/: 31,5...33,5  
1000H.: (30,3...34,7)  
7th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (27,8...32,2)  
8th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: 30,5...33,5  
1000H.: (29,0...35,0)  
9th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 29,5...32,5  
1000H.: (28,0...34,0)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Electr. shutoff:  
Speed 1/min: 2300  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,5...13,5)

High Idle:  
Speed 1/min: 470  
Del. quantity cm<sup>3</sup>/: 8,0...10,0  
1000H.: (5,0...13,0)

Residual:  
Speed 1/min: 550  
Del. quantity : -  
1000H.: 0...7,0

Automatic starting fuel delivery:

1st speed 1/min: 200

Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,4...1,55  
SVS max. mm : 3,0  
XK mm : 17,0...19,0  
XL mm : 11,5...14,9

Setting of residual delivery.

Idle setting (LFG) according to  
VDT-I-460/135.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,3 B  
Edition : 18.12.86  
replaces : 4.86  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 R207-1  
Type number : 0 460 494 196  
  
Customer-specific information  
Customer : FIAT-RITMO  
  
Engine : X8/34

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,1...4,5

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,3...5,9

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del.quantity cm3/  
1000H.: 29,5...30,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390  
Del.quantity cm3/  
1000H.: 10,0...14,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450  
Del.quantity cm3/  
1000H.: 19,0...25,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,6...2,4  
mm: (1,3...2,7)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,6...5,0)  
3rd speed 1/min: 2300  
TD travel mm: 7,0...7,8  
mm: (6,7...8,1)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 3,1...3,7  
2nd speed 1/min: 2300  
Supply-pump  
pressure bar: 7,2...7,8

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: -

Del. quantity cm<sup>3</sup>/: -  
1000H.: -  
2nd speed 1/min: 2900  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5  
3rd speed 1/min: 2650  
Del. quantity cm<sup>3</sup>/: 2,0...9,0  
1000H.: (1,5...9,5)  
4th speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (18,0...26,0)  
5th speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/: 31,8...34,2  
1000H.: (30,8...35,2)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (27,8...32,2)  
7th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 29,8...32,2  
1000H.: (28,7...33,3)  
8th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 30,0...33,0  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

1st speed 1/min: 390  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (8,0...16,0)  
2nd speed 1/min: 440  
Del. quantity cm<sup>3</sup>/: 1,0...7,0  
1000H.: (0...8,0)  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...1,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 48,0

2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

H02

Designation

K mm : 3,2...3,4  
KF mm : 5,7...5,9  
MS mm : 1,7...1,9  
SVS max. mm : 2,8

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 2,3 M  
Edition : 12.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243  
Type number : 0 460 494 197

Customer-specific information  
Customer : OPEL

Engine : 2,3 LIT.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1200  
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 43,0...44,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,0  
1000H.: -

Low-idle speed regulation:

Speed 1/min: 270  
Del. quantity cm<sup>3</sup>/  
1000H.: 10,0...14,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/  
1000H.: 21,0...27,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1200

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 800  
TD travel mm: 1,9...2,7  
mm: (1,6...3,0)  
3rd speed 1/min: 1200  
TD travel mm: -  
mm: (3,8...4,2)  
4th speed 1/min: 2200  
TD travel mm: 9,7...10,5  
mm: (9,4...10,8)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 800  
Supply-pump pressure bar: 3,0...3,6  
3rd speed 1/min: 2200  
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
quantity cm<sup>3</sup>/10s: (26...98)

2nd speed 1/min: 2200  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2700  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...3,0  
3rd speed 1/min: 2600  
Del. quantity cm<sup>3</sup>/  
1000H.: 4,0...12,0  
4th speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/  
1000H.: (4,0...12,0)  
5th speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/  
1000H.: (20,0...28,0)  
6th speed 1/min: 1200  
Del. quantity cm<sup>3</sup>/  
1000H.: (34,8...37,8)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: (34,0...38,6)  
1000H.: (41,2...45,8)  
1000H.: (32,0...38,0)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/  
1000H.:

Electr. shutoff:  
Speed 1/min: 2200  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/  
1000H.:

Idle delivery:

1st speed 1/min: 270  
Del. quantity cm<sup>3</sup>/  
1000H.: (8,0...16,0)  
2nd speed 1/min: 320  
Del. quantity cm<sup>3</sup>/  
1000H.: (3,0...9,0)  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: (2,0...10,0)  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/  
ind. 1000H.: 52,0  
2nd speed 1/min: 230  
Del. quantity cm<sup>3</sup>/  
ax. 1000H.: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,8..2,05
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 9,7...13,4

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN 2,0F1  
Edition : 02.04.87  
replaces :  
Calibrating oil : ISO 4113  
Injection pump : VE 4/9F2250 R158-1  
Type number : O 460 494 198  
Customer-specific information  
Customer : RENAULT  
Engine : J8S-A01

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1400  
Setting value mm: 4,4...4,8

Supply-pump pressure:

Speed 1/min: 1400  
Setting value bar: 4,9...5,5

Full-load del. w/out charge press.:

Speed 1/min : 1400  
Del. quantity cm<sup>3</sup>/  
1000H.: 35,0...36,0  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)



Low-idle speed regulation:

Speed 1/min: 425  
Del.quantity cm3/  
1000H.: 7,0...11,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2400  
Del.quantity cm3/  
1000H.: 17,0...23,0

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1400

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 2,6...3,4  
mm: (1,3...3,7)  
2nd speed 1/min: 1400  
TD travel mm: -  
mm: (3,9...5,3)  
3rd speed 1/min: 2000  
TD travel mm: 6,7...7,5  
mm: (6,4...7,8)

Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 1000  
Overflow quantity cm3/10s: 55...138  
2nd speed 1/min: 2200  
Overflow quantity cm3/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 2550

H07

Del.quantity cm3/: -  
1000H.: 0...5,0  
3rd speed 1/min: 2400  
Del.quantity cm3/: -  
1000H.: (16,0...24,0)  
4th speed 1/min: 2200  
Del.quantity cm3/: 37,0...39,0  
1000H.: (35,7...40,3)  
5th speed 1/min: 2100  
Del.quantity cm3/: 37,5...39,5  
1000H.: (36,2...40,8)  
6th speed 1/min: 1400  
Del.quantity cm3/: -  
1000H.: (33,2...37,8)  
7th speed 1/min: 1000  
Del.quantity cm3/: 34,0...37,0  
1000H.: (33,2...37,8)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del.quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm3/: 3  
1000H.

Idle delivery:

1st speed 1/min: 425  
Del.quantity cm3/: -  
1000H.: (5,0...13,0)  
2nd speed 1/min: 650  
Del.quantity cm3/: -  
1000H.: 0...5,0

Automatic starting fuel delivery:

1st speed 1/min: 370  
Del.quantity cm3/: -  
ind. 1000H.: 45,0  
2nd speed 1/min: 480  
Del.quantity cm3/: -  
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4

KF	mm	: 5,7...5,9
MS	mm	: 1,4...1,6
SVS max.	mm	: 3,6
XK	mm	: 18,8...20,8
XL	mm	: 9,4...12,8

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE 2,3 M1  
Edition : 12.12.86  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/9F2200 L243-2  
Type number : 0 460 494 203

Customer-specific information  
Customer : OPEL

Engine : 2,3 LIT.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.3

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1200  
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1200  
Del.quantity cm<sup>3</sup>/  
1000H.: 43,0...44,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,0

Low-idle speed regulation:

Speed 1/min: 270  
Del. quantity cm3/1000H.: 10,0...14,0  
Dispersion cm3/2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2450  
Del. quantity cm3/1000H.: 21,0...27,0

Start:

Speed 1/min: 100  
Del. quantity mind. cm3/1000H.: 52,0

Load-dependent start of delivery:

Speed 1/min: 1200

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 800  
TD travel mm: 1,9...2,7  
mm: (1,6...3,0)  
3rd speed 1/min: 1200  
TD travel mm: -  
mm: (3,8...4,2)  
4th speed 1/min: 2200  
TD travel mm: 9,7...10,5  
mm: (9,4...10,8)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 800  
Supply-pump pressure bar: 3,0...3,6  
3rd speed 1/min: 2200  
Supply-pump pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm3/10s: 41...83  
quantity cm3/10s: (26...98)

2nd speed 1/min: 2200  
Overflow quantity cm3/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2700  
Del. quantity cm3/1000H.: -  
0...3,0  
3rd speed 1/min: 2600  
Del. quantity cm3/1000H.: 4,0...12,0  
(4,0...12,0)  
4th speed 1/min: 2450  
Del. quantity cm3/1000H.: -  
(20,0...28,0)  
5th speed 1/min: 2200  
Del. quantity cm3/1000H.: 34,8...37,8  
(34,0...38,6)  
6th speed 1/min: 1200  
Del. quantity cm3/1000H.: -  
(41,2...45,8)  
7th speed 1/min: 600  
Del. quantity cm3/1000H.: 33,5...36,5  
(32,0...38,0)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm3/1000H.: -

Electr. shutoff:  
Speed 1/min: 2200  
ELAB volt: -  
Del. quantity cm3/1000H.: -

Idle delivery:

1st speed 1/min: 270  
Del. quantity cm3/1000H.: -  
(8,0...16,0)  
2nd speed 1/min: 320  
Del. quantity cm3/1000H.: 3,0...9,0  
(2,0...10,0)  
3rd speed 1/min: 400  
Del. quantity cm3/1000H.: -  
0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/ind. 1000H.: -  
52,0  
2nd speed 1/min: 230  
Del. quantity cm3/ax. 1000H.: -  
35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0  
XK mm : 18,7...20,7  
XL mm : 9,3...12,7

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,7 P2  
Edition : 18.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 R256  
Type number : O 460 494 204  
  
Customer-specific information  
Customer : FIAT UNO  
  
Engine : X8/34

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1500  
Setting value mm: 4,3...4,7  
  
Supply-pump pressure:  
  
Speed 1/min: 1500  
Setting value bar: 5,3...5,9  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390  
Del.quantity cm3/  
1000H.: 10,0...14,0  
Dispersion cm3/: 2,0  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2300  
Del.quantity cm3/  
1000H.: 31,8...34,2

Start:

Speed 1/min: 100  
Del.quantity mind.  
cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,2...2,0  
mm: (0,9...2,3)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 2300  
TD travel mm: 7,4...8,2  
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3,1...3,7  
2nd speed 1/min: 2300  
Supply-pump pressure bar: 7,1...7,7

Overflow quantity at overflow valve:

1st speed 1/min: 2300  
Oveflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2900  
Del.quantity cm3/: -  
1000H.: 0...1,5  
3rd speed 1/min: 2650

Del.quantity cm3/: 1,5...8,5  
1000H.: (1,0...9,0)  
4th speed 1/min: 2450  
Del.quantity cm3/: 19,0...25,0  
1000H.: (18,0...26,0)  
5th speed 1/min: 2300  
Del.quantity cm3/: -  
1000H.: (30,8...35,2)  
6th speed 1/min: 1500  
Del.quantity cm3/: -  
1000H.: (27,8...32,2)  
7th speed 1/min: 1000  
Del.quantity cm3/: 28,8...31,2  
1000H.: (27,8...32,2)  
8th speed 1/min: 600  
Del.quantity cm3/: 30,0...33,0  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del.quantity cm3/: -  
1000H.:

Idle delivery:

1st speed 1/min: 390  
Del.quantity cm3/: -  
1000H.: (8,0...16,0)  
2nd speed 1/min: 440  
Del.quantity cm3/: 0...6,0  
1000H.: (0...7,0)  
3rd speed 1/min: 500  
Del.quantity cm3/: -  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del.quantity cm3/: -  
ind. 1000H.: 48,0  
2nd speed 1/min: 400  
Del.quantity cm3/: -  
ax. 1000H.: 45,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,7...1,95  
SVS max. mm : -

XK mm : 17,0...19,0  
XL mm : 9,8...13,2

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W19  
Edition : 02.04.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2400 R221-2  
Type number : 0 460 494 207  
  
Customer-specific information  
Customer : VW  
  
Engine : 086-1,6L

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.2  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1250  
Setting value mm: 2,1...2,5  
  
Supply-pump pressure:  
  
Speed 1/min: 1250  
Setting value bar: 4,0...4,6  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 28,5...29,5  
  
Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 12,0...14,0

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2600  
Del. quantity cm3/  
1000H.: 11,0...17,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm3/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1800  
TD travel mm: 4,2...5,0  
mm: (3,0...5,3)  
4th speed 1/min: 2400  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 1,9...2,9  
2nd speed 1/min: 2400  
Supply-pump pressure bar: 7,1...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow quantity cm3/10s: 55...70  
cm3/10s: (50...75)  
2nd speed 1/min: 2400  
Overflow quantity cm3/10s: 82...112  
cm3/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Del. quantity cm3/: -  
1000H.: 0...4,0  
3rd speed 1/min: 2600  
Del. quantity cm3/: -  
1000H.: (10,0...18,0)  
4th speed 1/min: 2500  
Del. quantity cm3/: 19,0...29,0  
1000H.: (18,0...30,0)  
5th speed 1/min: 2400  
Del. quantity cm3/: 27,5...29,5  
1000H.: (26,3...30,7)  
6th speed 1/min: 1000  
Del. quantity cm3/: -  
1000H.: (26,8...31,2)  
7th speed 1/min: 600  
Del. quantity cm3/: 22,5...25,5  
1000H.: (21,0...27,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: -  
Del. quantity cm3/: -  
1000H.

Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del. quantity cm3/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (9,0...17,0)  
2nd speed 1/min: 425  
Del. quantity cm3/: 5,5...8,5  
1000H.: (3,0...11,0)

High Idle:

Speed 1/min: 525  
Del. quantity cm3/: 7,0...9,0  
1000H.: (4,0...12,0)

Residual:

Speed 1/min: 500  
Del. quantity : 2,5...4,5  
1000H.: (1,0...6,0)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del. quantity cm3/: -  
ind. 1000H: 35,0  
2nd speed 1/min: 380

Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3..1,55
SVS max.	mm	: 3,1

Setting of residual delivery.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 G  
Edition : 16.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 R272  
Type number : 0 460 494 211  
  
Customer-specific information  
Customer : PEUGEOT  
  
Engine : XUD 9A

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0.3  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1250  
Setting value mm: 3,0...3,4  
  
Supply-pump pressure:  
  
Speed 1/min: 1250  
Setting value bar: 3,9...4,5  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 1250  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

## Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...10,0  
Dispersion cm<sup>3</sup>/: 2,0  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,5...3,5  
Full-load speed regulation:

Speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/  
1000H.: 19,0...25,0

## Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 45,0

## Load-dependent start of delivery:

Speed 1/min: 1250

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0,6...1,4  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (2,5...3,9)  
3rd speed 1/min: 2000  
TD travel mm: 6,7...7,5  
mm: (6,4...7,8)

## Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 2000  
Supply-pump  
pressure bar: 5,9...6,5

## Overflow quantity at overflow valve:

1st speed 1/min: 800  
Oveflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2300  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Del. quantity cm<sup>3</sup>/: -  
1000H.: 0...10,0  
3rd speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (18,0...26,0)  
4th speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/: 31,5...34,5  
1000H.: (30,8...35,2)  
5th speed 1/min: 1250  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (27,8...32,2)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: 30,5...33,5  
1000H.: (29,0...35,0)  
7th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 30,5...33,5  
1000H.: (29,0...35,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/: -  
1000H.

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (5,0...13,0)

High Idle:

Speed 1/min: 470  
Del. quantity cm<sup>3</sup>/: 8,0...10,0  
1000H.: (5,0...13,0)

Residual:

Speed 1/min: 550  
Del. quantity : -  
1000H.: 0...7,0

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

H19

Designation

K mm : 3,2...3,4  
KF mm : 5,4...5,7  
MS mm : 1,3...1,55  
SVS max. mm : -

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 1,9 E1  
Edition : 16.12.86  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/9F2300 R141-1  
Type number : O 460 494 212  
  
Customer-specific information  
Customer : FIAT  
  
Engine : X8/43

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0.2

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Setting value mm: 4,3...4,7

Supply-pump pressure:

Speed 1/min: 1500  
Setting value bar: 5,6...6,2

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,2...30,2  
Dispersion cm<sup>3</sup>/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 390  
Del. quantity cm<sup>3</sup>/  
1000H.: 9,0...13,0  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/  
1000H.: 11,0...17,0

Start:

Speed 1/min: 100  
Del. quantity mind.  
cm<sup>3</sup>/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 2300  
TD travel mm: 7,1...7,9  
mm: (6,8...8,2)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump pressure bar: 2,8...3,4  
2nd speed 1/min: 2300  
Supply-pump pressure bar: 7,4...8,0

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 2300  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: -

Del. quantity cm<sup>3</sup>/  
1000H.: -

2nd speed 1/min: 2600  
Del. quantity cm<sup>3</sup>/  
1000H.: (2,5...10,5)

3rd speed 1/min: 2500  
Del. quantity cm<sup>3</sup>/  
1000H.: (10,0...18,0)

4th speed 1/min: 2400  
Del. quantity cm<sup>3</sup>/  
1000H.: (20,0...28,0)

5th speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/  
1000H.: (30,0...34,4)

6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/  
1000H.: (26,5...31,9)

7th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (28,0...32,4)

8th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000H.: (28,5...34,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del. quantity cm<sup>3</sup>/  
1000H.: -

Idle delivery:

1st speed 1/min: 390  
Del. quantity cm<sup>3</sup>/  
1000H.: (7,0...15,0)  
2nd speed 1/min: 440  
Del. quantity cm<sup>3</sup>/  
1000H.: (0...8,0)  
3rd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 0...2,5

Automatic starting fuel delivery:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
ind. 1000H.: 45,0  
2nd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
ax. 1000H.: 46,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,1...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,7...1,9
SVS max.	mm	: 2,8
XK	mm	: 20,2...22,2
XL	mm	: 10,3...13,7

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 Q2  
Edition : 12.06.87  
Superceeded : 23.9.86  
Calibrating oil : ISO-4113

Combination no. : 0 401 846 758

Injection pump  
Pump designation : PE6P110A32ORS3108Z  
EP type number : 0 411 816 728  
Governor  
Governor design. : RQV250...1100PA649  
Governor no. : 0 421 813 346

Customer-spec. information  
Customer : VOLVO

Engine : THD100EB

1st version kW : 160.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 12.2...12.4

100H.: (11.9...12.7)

Dispersion cm<sup>3</sup>/ : 0.4

100H.: (0.7)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 3.0...3.4

100H.: (2.7...3.6)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.10...1.30

2nd speed 1/min: 500

Sleeve travel mm: 4.10...4.90

3rd speed 1/min: 700

Sleeve travel mm: 6.30...6.70

4th speed 1/min: 950

Sleeve travel mm: 6.30...6.70

5th speed 1/min: 1100

Sleeve travel mm: 7.00...7.50

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1175

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 750

Del.quantity cm<sup>3</sup>/ : 122.0...124.0

1000H.: (119.0...127.0)

Dispersion cm<sup>3</sup>/ : 4.00

1000H.: (7.50)

H24

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 9.50

Speed 1/min : 1160...1170

2nd c-rod trav.mm : 4.00

Speed 1/min : 1225...1255

4th speed 1/min : 1350

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 7...15

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6.80

Speed 1/min : 250

C-rod trav.mm : 5.30...5.50

C-rod trav.mm : 2.00

Speed 1/min : 350...410

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 750

Contr.-rod trav.mm: 10.50...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.60...9.80

2nd pressure hPa : 265

C-rod trav.mm : 9.90...10.00

3rd pressure hPa : 310

C-rod trav.mm : 10.20...10.40

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -

Speed 1/min : 700

Del.quantity cm<sup>3</sup>/ : 105.5...108.5

1000H.: (103.0...111.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 160.0...190.0

Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 30.0...34.0  
1000H.: (27.5...36.5)  
Dispersion cm<sup>3</sup>/ : 3.00  
1000H.: (6.00)

Remarks:

SETTING OF FBG

- Setting and locking of FBG according to start-of-delivery average of all cylinders  $19.3...19.7^{\circ}$  ( $19.2...19.8^{\circ}$ ).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value  $1^{\circ}$  cam angle maximum.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

- Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
- Control-lever position  $48.5^{\circ}$ ,  
control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

- Control lever at idle stop.  
With  $n = 335$  1/min. and  $p_u = 450$  mbar,  
control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P7  
Edition : 14.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 918  
Injection pump  
Pump designation : PES4M55C32ORS152-3  
EP type number : 0 400 054 967  
Governor  
Governor design. : RSF360/2300M59-16  
Governor no. : 0 420 021 076

Customer-spec. information  
Customer : DB

Engine : OM601 (2.0 L)  
1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 469 990 351  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 3- 4- 2

H27

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING.

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 11.10...11.20  
-----  
Del.quantity cm3/ : 3.1...3.2  
-----  
100H.: (3.0...3.3)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 335.0  
Contr.-rod trav. mm: 5.4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100H.: (0.4...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 31.0...32.0  
1000H.: (30.0...33.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7.80...8.20  
Speed 1/min : 0...2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 0,90...1,00

## LOWEST RATED SPEED I

Control-lever  
position degrees: 13...17  
Setting point w/out aux. spring  
Speed 1/min : 335  
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 225  
C-rod trav.mm min : 9.50  
Speed 1/min : 335  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 590...690  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.10...11.20  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.80...11.00  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.30...10.50

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.0...35.0  
1000H.: (32.0...36.0)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 335  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 335  
Contr.-rod trav.mm: (12,00...13,40)  
Del.quantity cm3/ : (31,00...38,00)  
1000H.: -  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: 0,00...1,00  
Electric current  
short-duration A : 3,00  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,00

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according  
to start-of-delivery average of all  
cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
-Control-lever position 48.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 335 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P8  
Edition : 07.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 919  
Injection pump  
Pump designation : PES4M55C32ORS152-3  
EP type number : 0 410 054 967  
Governor  
Governor design. : RSF375/2300M55-15  
Governor no. : 0 420 021 069

Customer-spec. information  
Customer : DB

Engine : OM601 (2.0 L)  
1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 469 990 351  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 3- 4- ?

J01

SD ang. spacing<sup>0</sup>CS: 0-90-180-270  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 11.10...11.20  
-----  
Del.quantity cm3/ : 3.1...3.2  
-----  
100H.: (3.0...3.3)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 375.0  
Contr.-rod trav. m: 5.4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100H.: (0.4...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 31.0...32.0  
1000H.: (30.0...33.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 0...2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 0,90...1,00

## LOWEST RATED SPEED I

Control-lever  
position degrees: 13...17  
Setting point w/out aux. spring  
Speed 1/min : 375  
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 250  
C-rod trav.mm min : 11.50  
Speed 1/min : 375  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 630...730  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,40...4,60  
: (4,30...4,70)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.10...11.20  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.80...11.00  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.30...10.50

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.0...35.0  
1000H.: (32.0...36.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 425  
Contr.-rod trav.mm: (7,00...8,60)  
Del.quantity cm<sup>3</sup>/ : (13,00...21,00)  
1000H.: -  
Vacuum hPa : 0,40

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P9  
Edition : 05.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 920  
Injection pump  
Pump designation : PES4M55C32ORS152-3  
EP type number : 0 410 054 967  
Governor  
Governor design. : RSF375/2300M55-14  
Governor no. : 0 420 021 068

Customer-spec. information  
Customer : DB

Engine : OM601 (2.0 L)  
1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 469 990 351  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)  
Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 3- 4- 2

J03

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 11.10...11.20  
-----  
Del.quantity cm3/ : 3.1...3.2  
-----  
100H.: (3.0...3.3)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 375.0  
Contr.-rod trav. m: 5.4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100H.: (0.4...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 31.0...32.0  
1000H.: (30.0...33.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 0...2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 0,90...1,00

## LOWEST RATED SPEED I

Control-lever  
position degrees: 13...17  
Setting point w/out aux. spring  
Speed 1/min : 375  
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 250  
C-rod trav.mm min : 11.50  
Speed 1/min : 375  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 630...730  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,40...4,60  
: (4,30...4,70)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.10...11.20  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.80...11.00  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.30...10.50

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.0...35.0  
1000H.: (32.0...36.0)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 425  
Contr.-rod trav.mm: (7,00...8,60)  
Del.quantity cm3/ : (13,00...21,00)  
1000H.: -  
Vacuum hPa : 0,40

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V1  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 921  
Injection pump  
Pump designation : PES4M55C32ORS107-2  
EP type number : 0 410 054 962  
Governor  
Governor design. : RSF375/2250M17  
Governor no. : 0 420 021 016

Customer-spec. information  
Customer : DB

Engine : OM616 (2.4 L)  
1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 012  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 2.20...2.30  
                  : (2.15...2.35)  
Contr.-rod trav.mm: 20.00...0.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - : 0.00 (1.00)

## BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 13.00...13.10  
-----  
Del.quantity cm3/ : 3.7...3.8  
-----  
100H.: (3.6...3.9)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 375.0  
Contr.-rod trav. m: 6.1...6.3  
Del.quantity cm3/ : 0.6...0.7  
100H.: (0.5...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 37.5...38.5  
1000H.: (36.5...39.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 0...2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 1,40...1,50

## LOWEST RATED SPEED I

Control-lever  
position degrees: 9...13  
Setting point w/out aux. spring  
Speed 1/min : 375  
Contr.-rod trav.mm: 6.2

## Testing:

Speed 1/min : 250  
C-rod trav.mm min : 10.50

Speed 1/min : 375  
C-rod trav.mm : 6.10...6.30  
C-rod trav.mm : 2.00  
Speed 1/min : 720...820  
Speed 1/min : 1000  
C-rod trav.mm max : 1.50

SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4.90...5.10  
: (4.80...5.20)

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.00...13.10  
2nd speed 1/min : 1800  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 2200  
C-rod trav.mm : 11.70...11.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 20.0...24.0  
1000H.: (19.0...25.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 6.10...6.30  
Del.quantity cm3/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

Remarks:

J06

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 47°. No  
change in control-rod travel after  
switchover point up to 550 1/min,  
control-lever position 30°. Speed  
range 350 1/min...450 1/min.

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 375 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V2  
 Edition : 09.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 074 922  
 Injection pump  
 Pump designation : PES4M55C32ORS107-2  
 EP type number : 0 410 054 962  
 Governor  
 Governor design. : RSF375/2250M18  
 Govenner no. : 0 420 021 017

Customer-spec. information  
 Customer : DB

Engine : OM616 (2.4 L)  
 1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 012  
 Inlet press., bar : 1.00  
 Calibrating nozzle-holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test inj. tubing : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Contr.-rod trav.mm: 20.00...0.00  
 Cam sequence : 1- 3- 4- 2

J07

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
 Tolerance + - : 0.00 (1.00)

## BASIC SETTING

1st speed 1/mi: 1000  
 -----  
 Contr.-rod trav.mm: 13.00...13.10  
 -----  
 Del.quantity cm3/ : 3.7...3.8  
 -----  
 100H.: (3.6...3.9)  
 -----  
 Dispersion cm3/ : 0.2  
 -----  
 100H.: (0.3)  
 -----  
 2nd speed 1/min: 375.0  
 Contr.-rod trav. m: 6.1...6.3  
 Del.quantity cm3/ : 0.6...0.7  
 100H.: (0.5...0.9)  
 Dispersion cm3/ : 0.1  
 100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1000  
 Del.quantity cm3/ : 37.5...38.5  
 1000H.: (36.5...39.5)  
 Dispersion cm3/ : 2.50  
 1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 50...0  
 3rd c-rod trav.mm : 7,80...8,20  
 Speed 1/min : 0...2500  
 4th speed 1/min : 2950  
 C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
 Speed 1/min : 1000  
 Contr.-rod trav.mm: 1,40...1,50

## LOWEST RATED SPEED I

Control-lever  
 position degrees: 9...13  
 Setting point w/out aux. spring  
 Speed 1/min : 375  
 Contr.-rod trav.mm: 6.2

## Testing:

Speed 1/min : 250  
 C-rod trav.mm min : 10.50

Speed 1/min : 375  
C-rod trav.mm : 6.10...6.30  
C-rod trav.mm : 2.00  
Speed 1/min : 720...820  
Speed 1/min : 1000  
C-rod trav.mm max : 1.50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4,90...5,10  
: (4,80...5,20)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 13.00...13.10  
2nd speed 1/min : 1800  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 2200  
C-rod trav.mm : 11.70...11.90

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000H.: (19.0...25.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

Remarks:

J08

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No  
change in control-rod travel after  
switchover point up to 550 1/min,  
control-lever position 30°. Speed  
range 350 1/min...450 1/min.

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 375 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F1  
Edition : 30.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 960  
Injection pump  
Pump designation : PESSM55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M67-1  
Governor no. : 0 420 021 098

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm<sup>3</sup>/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm<sup>3</sup>/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm<sup>3</sup>/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,90...1,00

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 10.00  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 640...740  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,20...4,40  
                          : (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
    C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
    C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
    C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
    1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
    1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
    1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
    1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
    1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
    1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
    1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
    1000H.: (4.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
    1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400  
Contr.-rod trav.mm: (5,20...6,80)  
Del.quantity cm<sup>3</sup>/ : (5,00...13,00)  
    1000H.: -  
Vacuum hPa : 0,40

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F  
 Edition : 30.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 075 961  
 Injection pump  
 Pump designation : PESSM55C32ORS153  
 EP type number : 0 410 055 991  
 Governor  
 Governor design. : RSF350/2300M67  
 Governor no. : 0 420 021 094

Customer-spec. information  
 Customer : DB

Engine : OM602  
 1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 469 990 351  
 Inlet press., bar : 1.00  
 Calibrating nozzle-holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)  
 Contr.-rod trav.mm: 20.00...22.00  
 Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000  
 -----  
 Contr.-rod trav.mm: 11.30...11.40  
 -----  
 Del.quantity cm3/ : 3.1...3.2  
 -----  
 100H.: (3.0...3.3)  
 -----  
 Dispersion cm3/ : 0.2  
 -----  
 100H.: (0.3)  
 -----  
 2nd speed 1/min: 350.0  
 Contr.-rod trav. m: 5.4...5.6  
 Del.quantity cm3/ : 0.5...0.6  
 100H.: (0.4...0.9)  
 Dispersion cm3/ : 0.1  
 100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1000  
 Del.quantity cm3/ : 31.5...32.5  
 1000H.: (30.5...33.5)  
 Dispersion cm3/ : 2.50  
 1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 50...0  
 2nd c-rod trav.mm : 7.80  
 Speed 1/min : 0...2500  
 4th speed 1/min : 2950  
 C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
 Speed 1/min : 1000  
 Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever  
 position degrees: 13...17  
 Setting point w/out aux. spring  
 Speed 1/min : 350  
 Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 10.00  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 640...740  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4.00...4.40  
                          : (4.10...4.50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400  
Contr.-rod trav.mm: (5.2...6.8)  
Del.quantity cm3/ : -  
1000H.: (5.0...13.0)  
Vacuum hPa : 0.4

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F2  
Edition : 07.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 964  
Injection pump  
Pump designation : PESSM55C32ORS162  
EP type number : 0 410 055 983  
Governor  
Governor design. : RSF340/2300M60-15  
Governor no. : 0 420 021 081

Customer-spec. information  
Customer : DB

Engine : OM602-LVP MJ:86  
1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80  
                  : (1.65...1.85)  
Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 315.0

Contr.-rod trav. m: 5.2...5.4

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.0...32.0

1000H.: (30.0...33.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,10...7,50

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,90...2,00

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 315

Contr.-rod trav.mm: 5.3

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.50  
Speed 1/min : 315  
C-rod trav.mm : 5.20...5.40  
C-rod trav.mm : 2.50  
Speed 1/min : 530...630  
Speed 1/min : 1000  
C-rod trav.mm max : 2.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 380  
Contr.-rod trav.mm: 3,90...4,10  
: (3,80...4,20)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1600  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2250  
C-rod trav.mm : 10.30...10.50

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0.10...0.50

##### Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
C-rod trav.mm : 1.10...1.30  
2nd pressure hPa : 700  
C-rod trav.mm : 2.30...2.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1600  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2250  
Del.quantity cm3/ : 32.0...34.0  
1000H.: (31.0...35.0)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.10...7.50  
Del.quantity cm3/ : 16.0...20.0  
1000H.: (15.0...21.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 315  
Contr.-rod trav.mm: 5.20...5.40  
Del.quantity cm3/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 340  
Contr.-rod trav.mm: (12,5...13,9)  
Del.quantity cm3/ : (33,0...41,0)  
1000H.: -

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950  
Contr.-rod trav.mm: 0...1,0

Electric current

short-duration A : 3,0

Starting test

Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar,

control rod must move quickly to  
control-rod travel = 0 mm

START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders,  $17.3...17.7^{\circ}$   
( $17.2...17.8^{\circ}$ ) angular displacement of  
the cam after cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F4  
Edition : 05.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 968  
Injection pump  
Pump designation : PESSM55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300M59-14  
Governor no. : 0 420 021 074

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 315.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 31.5...32.5  
1000H.: (30.5...33.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever  
position degrees: 13...17  
Setting point w/out aux. spring  
Speed 1/min : 315  
Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 8.00  
Speed 1/min : 315  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 630...730  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 380  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 315  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 340  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (33,0...41,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F5  
Edition : 05.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 969  
Injection pump  
Pump designation : PESSM55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M55-16  
Governor no. : 0 420 021 070

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
Tolerance + -<sup>o</sup> : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:



Speed 1/min : 220  
C-rod trav.mm min : 10.00  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 640...740  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,20...4,40  
                          : (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400  
Contr.-rod trav.mm: 5,2...6,8  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (5,0...13,0)  
Vacuum hPa : 0,40

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and p<sub>u</sub> = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 G  
Edition : 05.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 075 970  
  
Injection pump  
Pump designation : PESSM55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF350/2300M55-13  
Governor no. : 0 420 021 067

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values \_\_\_\_\_

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 2- 4- 5- 3

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SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.4...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 10.00  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 640...740  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.0...6.0  
1000H.: (4.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING PNEUMATIC FAST IDLE (ELA)

Speed 1/min : 400  
Contr.-rod trav.mm: (5,2...6,8)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (5,0...13,0)  
Vacuum hPa : 0,40

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W6  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 971  
Injection pump  
Pump designation : PESSM55C32ORS108-3  
EP type number : 0 410 055 982  
Governor  
Governor design. : RSF350/2300M16  
Governor no. : 0 420 021 015

Customer-spec. information  
Customer : DB

Engine : OM617 (3.0 L)  
1st version kW : 65.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 012  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 2.20...2.30  
                  : (2.15...2.35)  
Contr.-rod trav.mm: 20.00...0.00  
Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + -<sup>0</sup> : 0.00 (1.00)

## BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 13.00...13.10  
-----  
Del.quantity cm3/ : 3.7...3.8  
-----  
100H.: (3.6...3.9)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 350.0  
Contr.-rod trav. m: 6.1...6.3  
Del.quantity cm3/ : 0.6...0.7  
100H.: (0.5...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 37.5...38.5  
1000H.: (36.5...39.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 1,4...1,5

## LOWEST RATED SPEED I

Control-lever  
position degrees: 9...13  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 6.2

## Testing:

Speed 1/min : 250  
C-rod trav.mm min : 9.50

Speed 1/min : 350  
C-rod trav.mm : 6.10...6.30  
C-rod trav.mm : 2.00  
Speed 1/min : 720...820  
Speed 1/min : 1000  
C-rod trav.mm max : 1.50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4,70...4,90  
: (4,60...5,00)

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.00...13.10  
2nd speed 1/min : 1800  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 2200  
C-rod trav.mm : 11.70...11.90

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 20.0...24.0  
1000H.: (19.0...25.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 6.10...6.30  
Del.quantity cm3/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

Remarks:

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W7  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 972  
Injection pump  
Pump designation : PES5M55C32ORS108-3  
EP type number : 0 410 055 982  
Governor  
Governor design. : RSF350/2300M15  
Governor no. : 0 420 021 014

Customer-spec. information  
Customer : DB

Engine : OM617 (3.0 L)

1st version kW : 65.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2,20...2,30  
                  : (2,15...2,35)

Contr.-rod trav.mm: 20.00...0.00  
Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.00...13.10

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.5...38.5

1000H.: (36.5...39.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,4...1,5

## LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 6.2

Testing:

Speed 1/min : 250

C-rod trav.mm min : 9.50

Speed 1/min : 350  
C-rod trav.mm : 6.10...6.30  
C-rod trav.mm : 2.00  
Speed 1/min : 720...820  
Speed 1/min : 1000  
C-rod trav.mm max : 1.50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm : 4,70...4,90  
: (4,60...5,00)

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.00...13.10  
2nd speed 1/min : 1800  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 2200  
C-rod trav.mm : 11.70...11.90

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 37.5...39.5  
1000H.: (36.5...40.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000H.: (19.0...25.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

Remarks:

J25

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W8  
Edition : 12.09.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 075 973  
Injection pump  
Pump designation : PESSM55C32ORS108-2  
EP type number : 0 410 055 984  
Governor  
Governor design. : RSF350/1700M18-3  
Governor no. : 0 420 021 061

Customer-spec. information  
Customer : DB

Engine : OM617 (3.0 l)  
1st version kW : 54.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 012  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
                  : (2.15...2.35)  
Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1650  
-----  
Contr.-rod trav.mm: 11.90...12.00  
-----  
Del.quantity cm<sup>3</sup>/ : 3.5...3.6  
-----  
100H.: (3.4...3.7)  
-----  
Dispersion cm<sup>3</sup>/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 350.0  
Contr.-rod trav. m: 6.0...6.2  
Del.quantity cm<sup>3</sup>/ : 0.6...0.7  
100H.: (0.5...0.9)  
Dispersion cm<sup>3</sup>/ : 0.1  
100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1650  
Del.quantity cm<sup>3</sup>/ : 35.5...36.5  
1000H.: (34.5...37.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 6,80...7,20  
Speed 1/min : 1900  
4th speed 1/min : 2350  
C-rod trav.mm : 0.00...1,00

## SET IDLE CONTROL-LEVER POSITION

Speed 1/min : 600  
Contr.-rod trav.mm: 1,4...1,5

## LOWEST RATED SPEED I

Control-lever  
position degrees: 10...14  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 6.1

Testing:  
Speed 1/min : 250  
C-rod trav.mm min : 10.00



Speed 1/min : 450  
C-rod trav.mm : 4.60...4.80  
C-rod trav.mm : 2.00  
Speed 1/min : 700...800  
Speed 1/min : 300  
C-rod trav.mm max : 9.50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4.60...4.80  
: (4.50...4.90)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1650  
C-rod trav.mm : 11.90...12.00  
2nd speed 1/min : 1200  
C-rod trav.mm : 12.10...12.30  
3rd speed 1/min : 600  
C-rod trav.mm : 12.70...12.90

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1200  
Del.quantity cm3/ : 34.5...36.5  
1000H.: (33.5...37.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 600  
Del.quantity cm3/ : 34.5...36.5  
1000H.: (33.5...37.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 1900  
Contr.-rod trav.mm: 6.80...7.20  
Del.quantity cm3/ : 16.0...20.0  
1000H.: (15.0...21.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 6.00...6.20  
Del.quantity cm3/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### Remarks:

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop. At n = 350 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W9  
Edition : 30.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 974  
Injection pump  
Pump designation : PES6M55C32ORS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M66-1  
Governor no. : 0 420 021 097

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del. quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del. quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del. quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : (32,0...40,0)  
1000H.: -  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55,0  
min. 1000H.: -

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### ADJUSTING ACTIVE JOLT DAMPING (ARD)

Control lever at full-load stop. With  
 $n = 1000 \text{ 1/min.}$ ,  $I = 2.5 \text{ A}$ , control-rod-  
travel reduction = 2.25...2.55 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W10  
Edition : 30.03.87  
Superceeded : -  
Calibrating oil : ISC-4113

Combination no. : 0 400 076 975

Injection pump  
Pump designation : PES6M55C32ORS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M66  
Governor no. : 0 420 021 066

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7.80...8.20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

#### SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0.9...1.0

#### LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

K04

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000

C-rod trav.mm : 11.30...11.40

2nd speed 1/min : 1800

C-rod trav.mm : 10.90...11.10

3rd speed 1/min : 2200

C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800

Del.quantity cm3/ : 34.0...35.5

1000H.: (33.0...36.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

Speed 1/min : 2200

Del.quantity cm3/ : 33.5...35.5

1000H.: (32.5...36.5)

Dispersion cm3/ : 2.50

1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 55.0...0.0

1000H.: (55.0...0.0)

Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500

Contr.-rod trav.mm: 7.80...8.20

Del.quantity cm3/ : 22.0...26.0

1000H.: (21.0...27.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290

Contr.-rod trav.mm: 5.40...5.60

Del.quantity cm3/ : 5.5...6.5

1000H.: (5.0...9.5)

Dispersion cm3/ : 1.00

1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE  
REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (32,0...40,0)

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0

Electric current

short-duration A : 3,0

Starting test

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55,0  
min. 1000H.: -

Remarks:

SETTING OF FBG

-Setting and locking of FBG according  
to start-of-delivery average of all  
cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and p<sub>u</sub> = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

ADJUSTING ACTIVE JOLT DAMPING (ARD)

K05

Control lever at full-load stop. With  
n = 1000 1/min., I = 2.5 A, control-rod-  
travel reduction = 2.25...2.55 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W11  
Edition : 07.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 978  
Injection pump  
Pump designation : PES6M55C32ORS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF315/2300M65-12  
Governor no. : 0 420 021 088

Customer-spec. information  
Customer : DB

Engine : OM603A

1st version kW : 110.0

TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values \_\_\_\_\_

START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00  
Cam sequence : 1- 5- 3- 6- 2- 4



SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 13.90...14.00  
-----  
Del.quantity cm<sup>3</sup>/ : 5.1...5.2  
100H.: (5.0...5.3)  
-----  
Dispersion cm<sup>3</sup>/ : 0.2  
100H.: (0.3)  
-----  
2nd speed 1/min: 290.0  
Contr.-rod trav. m: 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 0.5...0.6  
100H.: (0.5...0.9)  
Dispersion cm<sup>3</sup>/ : 0.1  
100H.: (0.1)

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Charge press. hPa : 1850  
Del.quantity cm<sup>3</sup>/ : 51.0...52.0  
1000H.: (50.0...53.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 8,10...8,50  
Speed 1/min : 2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

#### SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 1,7...1,8

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 8...12  
Setting point w/out aux. spring  
Speed 1/min : 290  
Contr.-rod trav.mm: 5.4

#### Testing:

Speed 1/min : 200  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.30...5.50  
C-rod trav.mm : 2.50  
Speed 1/min : 510...610  
Speed 1/min : 1000  
C-rod trav.mm max : 1.80

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.90...14.00  
2nd speed 1/min : 1600  
C-rod trav.mm : 13.20...13.40  
3rd speed 1/min : 2200  
C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 1000  
Pressure hPa : 1600  
Contr.-rod trav.mm: 0.50...0.70

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 1050  
C-rod trav.mm : 3.90...4.10  
2nd pressure hPa : 750  
C-rod trav.mm : 5.80...6.20

#### FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1850  
Speed 1/min : 1600  
Del.quantity cm<sup>3</sup>/ : 50.0...51.5  
1000H.: (49.0...52.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Charge press. hPa : 1850  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 48.5...50.5  
1000H.: (47.5...51.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00  
Charge press. hPa : 1050  
Speed 1/min : 1000  
Del.quantity cm<sup>3</sup>/ : 33.0...34.0  
1000H.: (32.0...35.0)

Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 52.0...0.0  
1000H.: (52.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

1st version  
Charge press. hPa : 1850  
Speed 1/min : 2500  
Contr.-rod trav.mm: 8.10...8.50  
Del.quantity cm<sup>3</sup>/ : 29.0...33.0  
1000H.: (28.0...34.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,8...14,2)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (42,0...49,0)

Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)

Electric current  
short-duration A : 3,0

Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000H.: 52,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF  
-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 48.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W12  
Edition : 07.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 979  
Injection pump  
Pump designation : PES6M55C32ORS157-1  
EP type number : 0 410 056 991  
Governor  
Governor design. : RSF315/2300M65-10  
Governor no. : 0 420 021 087

Customer-spec. information  
Customer : DB

Engine : OM603A Touring

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K09

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100H.: (5.0...5.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Charge press. hPa : 1850

Del.quantity cm3/ : 51.0...52.0

1000H.: (50.0...53.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,10...8,50

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,7...1,8

## LOWEST RATED SPEED I

Control-lever

position degrees: 8...12

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.4

Testing:

Speed 1/min : 200  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.30...5.50  
C-rod trav.mm : 2.50  
Speed 1/min : 510...610  
Speed 1/min : 1000  
C-rod trav.mm max : 1.80

SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.90...14.00  
2nd speed 1/min : 1600  
C-rod trav.mm : 13.20...13.40  
3rd speed 1/min : 2200  
C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

1st version

Setting  
Speed 1/min : 1000  
Pressure hPa : 1600  
Contr.-rod trav.mm: 0.50...0.90

Measurement

Speed 1/min : 1000  
1st pressure hPa : 1050  
C-rod trav.mm : 3.90...4.10  
2nd pressure hPa : 750  
C-rod trav.mm : 5.80...6.20

FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1850  
Speed 1/min : 1600  
Del.quantity cm3/ : 50.0...51.5  
1000H.: (49.0...52.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Charge press. hPa : 1850  
Speed 1/min : 2200  
Del.quantity cm3/ : 48.5...50.5  
1000H.: (47.5...51.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00  
Charge press. hPa : 1050  
Speed 1/min : 1000  
Del.quantity cm3/ : 33.0...34.0  
1000H.: (32.0...35.0)

Dispersion cm3/ : 2.50  
1000H.: 3.00

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 52.0...0.0  
1000H.: (52.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

HIGH IDLE

1st version  
Charge press. hPa : 1850  
Speed 1/min : 2500  
Contr.-rod trav.mm: 8.10...8.50  
Del.quantity cm3/ : 29.0...33.0  
1000H.: (28.0...34.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.30...5.50  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,8...14,2)  
Del.quantity cm3/ : -  
1000H.: (42,0...49,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 52,0

Remarks:

SETTING OF FBG  
-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value  $1^{\circ}$  cam angle  
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^{\circ}$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W14  
 Edition : 07.11.86  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 076 982  
 Injection pump  
 Pump designation : PES6M55C32ORS156  
 EP type number : 0 410 056 995  
 Governor  
 Governor design. : RSF315/2300M60-14  
 Govenrer no. : 0 420 021 080

Customer-spec. information  
 Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K12

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0.10...0.50

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
C-rod trav.mm : 1.10...1.30  
2nd pressure hPa : 700  
C-rod trav.mm : 2.30...2.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm3/ : -  
1000H.: (32,0...40,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.
- Control-lever position  $46.5^{\circ}$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W15  
 Edition : 14.11.86  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 076 983  
 Injection pump  
 Pump designation : PES6M55C32ORS15b  
 EP type number : 0 410 056 995  
 Governor  
 Governor design. : RSF315/2300M59-15  
 Govenner no. : 0 420 021 075

Customer-spec. information  
 Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K15

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (32,0...40,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W16  
Edition : 07.11.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 984  
Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M59-13  
Governor no. : 0 420 021 073

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K17

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (32,0...40,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W17  
 Edition : 12.09.86  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 076 985  
 Injection pump  
 Pump designation : PES6M55C32ORS157-1  
 EP type number : 0 410 056 991  
 Governor  
 Governor design. : RSF315/2300M65-2  
 Governer no. : 0 420 021 062

Customer-spec. information  
 Customer : DB

Engine : OM603A

1st version kW : 110.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K19

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100H.: (5.0...5.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.3...5.5

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Charge press. hPa : 1850

Del.quantity cm3/ : 51.0...52.0

1000H.: (50.0...53.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,10...8,50

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1,00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,7...1,8

## LOWEST RATED SPEED I

Control-lever

position degrees: 8...12

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.4

**Testing:**

Speed 1/min : 200  
 C-rod trav.mm min : 7.00  
 Speed 1/min : 360  
 C-rod trav.mm : 4.20...4.40  
 C-rod trav.mm : 2.50  
 Speed 1/min : 510...610  
 Speed 1/min : 1000  
 C-rod trav.mm max : 1.80

**SET IDLE AUXILIARY SPRING**

Speed 1/min : 360  
 Contr.-rod trav.mm: 4,20...4,40  
 : (4,10...4,50)

**TORQUE CONTROL**

Torque-control curve - 1st version

1st speed 1/min : 1000  
 C-rod trav.mm : 13.90...14.00  
 2nd speed 1/min : 1600  
 C-rod trav.mm : 13.20...13.40  
 3rd speed 1/min : 2200  
 C-rod trav.mm : 12.30...12.50

compensator (LDA,ADA,ALDA)

**1st version**

Setting  
 Speed 1/min : 1000  
 Pressure hPa : 1600  
 Contr.-rod trav.mm: 0.50...0.90

**Measurement**

Speed 1/min : 1000  
 1st pressure hPa : 1050  
 C-rod trav.mm : 3.90...4.10  
 2nd pressure hPa : 750  
 C-rod trav.mm : 5.80...6.20

**FUEL-DELIVERY CHARACTERISTICS**

1st version  
 Charge press. hPa : 1850  
 Speed 1/min : 1600  
 Del.quantity cm3/ : 50.0...51.5  
 1000H.: (49.0...52.5)  
 Dispersion cm3/ : 2.50  
 1000H.: (3.00)  
 Charge press. hPa : 1850  
 Speed 1/min : 2200  
 Del.quantity cm3/ : 48.5...50.5  
 1000H.: (47.5...51.5)  
 Dispersion cm3/ : 2.50  
 1000H.: 3.00  
 Charge press. hPa : 1050  
 Speed 1/min : 1000  
 Del.quantity cm3/ : 33.0...34.0  
 1000H.: (32.0...35.0)

Dispersion cm3/ : 2.50  
 1000H.: 3.00

**STARTING FUEL DELIVERY**

Speed 1/min : 100  
 Contr.-rod trav.mm: 20.10...0.00

**HIGH IDLE**

1st version  
 Charge press. hPa : 1850  
 Speed 1/min : 2500  
 Contr.-rod trav.mm: 8.10...8.50  
 Del.quantity cm3/ : 29.0...33.0  
 1000H.: (28.0...34.0)  
 Dispersion cm3/ : 2.50  
 1000H.: (3.00)

**LOW IDLE**

Speed 1/min : 290  
 Contr.-rod trav.mm: 5.30...5.50  
 Del.quantity cm3/ : 5.5...6.5  
 1000H.: (5.0...9.5)  
 Dispersion cm3/ : 1.00  
 1000H.: (1.50)

**SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)**

Control lever at idle stop  
 Speed 1/min : 315  
 Contr.-rod trav.mm: (12,8...14,2)  
 Del.quantity cm3/ : -  
 1000H.: (42,0...49,0)  
 Electric current A: 1,8  
 Control lever at full-load stop  
 Speed 1/min : 2950  
 Contr.-rod trav.mm: (0,0...1,0)  
 Electric current  
 short-duration A : 3,0  
 Starting test  
 Speed 1/min : 100  
 Del.quantity cm3/ : -  
 min. 1000H.: 52,0

**Remarks:****SETTING OF FBG**

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
 Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value  $1^{\circ}$  cam angle  
maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position  $49^{\circ}$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^{\circ}$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W5  
Edition : 12.09.86  
Superceeded : 04.86  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 988  
Injection pump  
Pump designation : PES6M55C32ORS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M60-4  
Governor no. : 0 420 021 057

Customer-spec. information  
Customer : DB

Engine : DM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
                  : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance ° - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm: 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1,00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:



Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 360  
C-rod trav.mm : 4.20...4.40  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0.10...0.50

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
C-rod trav.mm : 1.10...1.30  
2nd pressure hPa : 700  
C-rod trav.mm : 2.30...2.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

K23

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm3/ : -  
1000H.: (32,0...40,0)

Electric current A: 1,8  
Control lever at full-load stop

Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)

Electric current  
short-duration A : 3,0

Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

Pin projection = 16.60...16.70 mm

#### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX  
-Control lever up against idle stop.

At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

-Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W1  
 Edition : 09.03.87  
 Superceeded : 11.85  
 Calibrating oil : ISO-4113

Combination no. : 0 400 076 990

Injection pump  
 Pump designation : PES6M55C32ORS156  
 EP type number : 0 410 056 995  
 Governor  
 Governor design. : RSF315/2300M59-5  
 Governer no. : 0 420 021 045

Customer-spec. information  
 Customer : DB

Engine : OM603-3.0  
 1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant. per values -----

## START OF DELIVERY

Test pressure, bar : 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000  
 -----  
 Contr.-rod trav.mm: 11.30...11.40  
 -----  
 Del.quantity cm3/ : 3.1...3.2  
 -----  
 100H.: (3.0...3.3)  
 -----  
 Dispersion cm3/ : 0.2  
 -----  
 100H.: (0.3)  
 -----

2nd speed 1/min: 290  
 Contr.-rod trav. m: 5.4...5.6  
 Del.quantity cm3/ : 0.5...0.6  
 100H.: (0.5...0.9)  
 Dispersion cm3/ : 0.1  
 100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1000  
 Del.quantity cm3/ : 31.5...32.5  
 1000H.: (30.5...33.5)  
 Dispersion cm3/ : 2.50  
 1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 0...50  
 3rd c-rod trav.mm : 7,80...8,20  
 Speed 1/min : 2500  
 4th speed 1/min : 2950  
 C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
 Speed 1/min : 1000  
 Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever  
 position degrees: 13...17  
 Setting point w/out aux. spring  
 Speed 1/min : 290  
 Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4.20...4.40  
: (4.10...4.50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm<sup>3</sup>/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm<sup>3</sup>/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm<sup>3</sup>/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12.6...14.0)  
Del.quantity cm<sup>3</sup>/ : -  
1000H.: (32.0...40.0)  
Electric current A: 1.8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0.0...1.0)  
Electric current  
short-duration A : 3.0  
Starting test  
Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : -  
min. 1000H.: 55.0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according  
to start-of-delivery average of all  
cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and p<sub>u</sub> = 450 mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W  
Edition : 09.03.87  
Superceeded : 11.85  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 994  
Injection pump  
Pump designation : PES6M55C320RS156  
EP type number : 0 410 056 995  
Governor  
Governor design. : RSF315/2300M59-3  
Governor no. : 0 420 021 040

Customer-spec. information  
Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

K27

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm<sup>3</sup>/ : 3.1...3.2

100H.: (3.0...3.3)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm<sup>3</sup>/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm<sup>3</sup>/ : 0.1

100H.: (0.1)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm<sup>3</sup>/ : 31.5...32.5

1000H.: (30.5...33.5)

Dispersion cm<sup>3</sup>/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,80...8,20

Speed 1/min : 2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 5.5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm3/ : -  
1000H.: (32,0...40,0)  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: (0,0...1,0)  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according  
to start-of-delivery average of all  
cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

#### CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9,6 N 1  
Edition : 12.09.86  
Superceeded : 10.85  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 646 266  
  
Injection pump  
Pump designation : PE6A95D410LS2587  
EP type number : 0 410 696 983  
Governor  
Governor design. : RQV300...1150AB1088L  
Governor no. : 0 420 212 115

Customer-spec. information  
Customer : KHD

Engine : F6L413

1st version kW : 115.0  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 6- 5- 4- 3- 2

SD ang. spacing<sup>0</sup>CS: 0-75-120-195-240-315  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 8.30...8.40

Del.quantity cm<sup>3</sup>/ : 7.2...7.4

100H.: (7.0...7.6)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100H.: (0.6...1.7)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.30...2.70

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.40...8.50

5th speed 1/min: 1235

Sleeve travel mm: 8.90...9.10

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm<sup>3</sup>/ : 72.0...74.0

1000H.: (70.0...76.0)

Dispersion cm<sup>3</sup>/ : 3.50

1000H.: (6.00)

### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 61...69

#### Testing:

1st c-rod trav.mm : 7.30  
Speed 1/min : 1190...1200  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1220...1250  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

### LOWEST RATED SPEED I

Control-lever  
position degrees: 68...76

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.00  
Speed 1/min : 300  
C-rod trav.mm : 6.40...6.60

### CONSTANT REGULATION

Speed 1/min : 320...420

### TORQUE CONTROL

Dimension a mm : 1.00  
Torque-control curve - 1st version  
1st speed 1/min : 1150  
C-rod trav.mm : 8.30...8.40  
2nd speed 1/min : 500  
C-rod trav.mm : 9.30...9.40  
3rd speed 1/min : 935  
C-rod trav.mm : 9.00...9.20  
4th speed 1/min : 1045  
C-rod trav.mm : 8.50...8.70

### SWITCH-OVER POINT

Speed 1/min : 220 (240)

### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm3/ : 78.0...81.0  
1000H.: (75.5...83.5)  
Speed 1/min : 800  
Del.quantity cm3/ : 93.5...101.5  
1000H.: (96.0...104.0)

### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 14.40...14.80

#### Remarks:

On activation of the starting solenoid,

the start position must be reached.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

When accelerating from engine speed "0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : KHD 12,7 N1  
Edition : 12.09.86  
Superceeded : 10.85  
Calibrating oil : ISO-4113  
Combination no. : 0 400 648 124  
Injection pump  
Pump designation : PE8A95D410LS2588  
EP type number : 0 410 698 989  
Governor  
Governor design. : RQV300...1150AB1088  
Governor no. : 0 420 212 115

Customer-spec. information  
Customer : KHD

Engine : F8L413FW

1st version kW : 153.0  
Speed 1/min: 2300

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
                  : (1.45...1.65)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 8- 7- 2- 6- 5-  
                  4- 3

SD ang. spacing°CS: 0-45-90-135-180-225-  
                          270-315

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

**BASIC SETTING**

1st speed 1/mi: 1150

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 7.1...7.3

100H.: (6.9...7.5)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.2...6.4

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with  
externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.20...2.60

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.50...8.50

5th speed 1/min: 1245

Sleeve travel mm: 9.10...9.30

**SLEEVE POSITION**

Control-lever position

Degree: -1

Speed 1/min: 1200

Cont.-rod travelmm: 15.20...17.80

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 71.0...73.0

1000H.: (69.0...75.0)

Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (6.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 61...69

#### Testing:

1st c-rod trav.mm : 8.30  
Speed 1/min : 1190...1200  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1230...1260  
4th speed 1/min : 1350  
C-rod trav.mm : 0.001.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 8...16

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.80  
Speed 1/min : 300  
C-rod trav.mm : 6.20...6.40

#### CONSTANT REGULATION

Speed 1/min : 320...430

#### TORQUE CONTROL

Dimension a mm : 1.00  
Torque-control curve - 1st version  
1st speed 1/min : 1150  
C-rod trav.mm : 9.30...9.40  
2nd speed 1/min : 500  
C-rod trav.mm : 10.30...10.40  
3rd speed 1/min : 935  
C-rod trav.mm : 10.00...10.20  
4th speed 1/min : 1045  
C-rod trav.mm : 9.50...9.70

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del. quantity cm<sup>3</sup>/ : 77.5...80.5  
1000H.: (75.0...83.0)  
Speed 1/min : 800  
Del. quantity cm<sup>3</sup>/ : 98.5...101.5  
1000H.: (96.0...104.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del. quantity cm<sup>3</sup>/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 15.40...15.80

L04

On activation of the starting solenoid,  
the start position must be reached.

2. Set fuel delivery in fuel-delivery  
characteristics with stop above the  
governor housing.

When accelerating from engine speed  
"0", no voltage in starting solenoid.

#### APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 12,7 P4  
Edition : 15.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 648 145  
Injection pump  
Pump designation : PE8A95D410LS2608  
EP type number : 0 410 698 988  
Governor  
Governor design. : RQ300/1100AB1230L  
Governor no. : 0 420 200 108

Customer-spec. information  
Customer : KHD

Engine : F8L413F

1st version kW : 162.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00

LOS

Cam sequence : 1- 8- 7- 2- 6- 5-  
4- 3

SD ang. spacing°CS: 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 10.00...10.10

Del.quantity cm3/ : 8.9...9.1

100H.: (8.7...9.3)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.8)

Dispersion cm3/ : 0.5

100H.: (0.7)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 550

Contr.-rod travelmm: 15.60...16.40

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 89.0...91.0

1000H.: (87.0...93.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

## HIGHEST RATED SPEED

Setting point:

Speed 1/min : 550

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 9.00

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1205...1235

## LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 6.5

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.00  
Speed 1/min : 300  
C-rod trav.mm : 6.40...6.60  
C-rod trav.mm : 2.00  
Speed 1/min : 355...395

TORQUE CONTROL

Dimension a mm : 0.25  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 10.00...10.10  
2nd speed 1/min : 550  
C-rod trav.mm : 10.50...10.60  
3rd speed 1/min : 785  
C-rod trav.mm : 10.30...10.50  
4th speed 1/min : 915  
C-rod trav.mm : 10.10...10.30

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 650  
Del.quantity cm<sup>3</sup>/ : 90.5...93.5  
1000H.: (88.0...96.0)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 14.70...15.70

Remarks: 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 15,8 N1  
Edition : 15.05.87  
Superceeded : 10.85  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 649 219  
  
Injection pump  
Pump designation : PE10A95D610/4LS2589  
EP type number : 0 410 699 994  
Governor  
Governor design. : RQV300...1150AB1047D  
L  
Governor no. : 0 420 214 242

Customer-spec. information  
Customer : KHD

Engine : F10L413

1st version kW : 192.0  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values \_\_\_\_\_

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)

L07

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1-10- 9- 4- 3- 6-  
5- 8- 7- 2

SD ang. spacing°CS: 0-27-72-99-144-171-  
216-243-288-315  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm<sup>3</sup>/ : 6.9...7.1

100H.: (6.7...7.3)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 7.2...7.4

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 400

Sleeve travel mm: 2.20...2.60

3rd speed 1/min: 600

Sleeve travel mm: 3.00...3.50

4th speed 1/min: 1195

Sleeve travel mm: 8.40...8.50

5th speed 1/min: 1235

Sleeve travel mm: 9.10...9.30

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm<sup>3</sup>/ : 69.0...71.0

1000H.: (67.0...73.0)

Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (6.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 61...69

#### Testing:

1st c-rod trav.mm : 8.30  
Speed 1/min : 1190...1200  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1230...1260  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 10...18

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.80  
Speed 1/min : 300  
C-rod trav.mm : 7.20...7.40

#### CONSTANT REGULATION

Speed 1/min : 320...430

#### TORQUE CONTROL

Dimension a mm : 1.00  
Torque-control curve - 1st version  
1st speed 1/min : 1150  
C-rod trav.mm : 9.30...9.40  
2nd speed 1/min : 500  
C-rod trav.mm : 10.30...10.40  
3rd speed 1/min : 935  
C-rod trav.mm : 10.00...10.20  
4th speed 1/min : 1045  
C-rod trav.mm : 9.50...9.70

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm<sup>3</sup>/ : 75.5...78.5  
1000H.: (73.0...81.0)  
Speed 1/min : 800  
Del.quantity cm<sup>3</sup>/ : 98.5...101.5  
1000H.: (96.0...104.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 15.40...15.80

LO8

#### Remarks:

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 6,0 H 6  
Edition : 12.09.86  
Superceeded : 10.84  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 656 159  
  
Injection pump  
Pump designation : PE6A85D412RS2303Y  
EP type number : 0 410 686 940  
Governor  
Governor design. : RQV250...1400AB879DL  
Governor no. : 0 420 214 186

Customer-spec. information  
Customer : STEYR

Engine : WD612.90

1st version kW : 154.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
                  : (2.45...2.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

L09

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400  
-----  
Contr.-rod trav.mm: 14.20...14.30  
-----  
Del.quantity cm3/ : 9.6...9.7  
-----  
100H.: (9.4...9.9)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.4)  
-----

2nd speed 1/min: 250.0  
Contr.-rod trav. m: 8.9...9.1  
Del.quantity cm3/ : 1.0...1.5  
100H.: (0.8...1.7)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1450  
Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1400  
Charge press. hPa : 700  
Del.quantity cm3/ : 96.0...97.0  
1000H.: (94.0...99.0)  
Dispersion cm3/ : 3.00  
1000H.: (4.50)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 43...51

## Testing:

1st c-rod trav.mm : 13.20  
Speed 1/min : 1440...1450  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1580...1610  
3rd c-rod trav.mm : 0.00...1.00  
Speed 1/min : 1700

## LOWEST RATED SPEED I

Control-lever  
position degrees: 9...17

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 10.40  
C-rod trav.mm : 2.00  
Speed 1/min : 380...440  
Speed 1/min : 500  
C-rod trav.mm max : 1.00

CONSTANT REGULATION

Speed 1/min : 340...450

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 1400  
Pressure hPa : 700  
Contr.-rod trav.mm: 14.20...14.30

Measurement

Speed 1/min : 1400

1st pressure hPa : -  
C-rod trav.mm : 12.50...12.60  
2nd pressure hPa : 240  
C-rod trav.mm : 13.80...13.90  
3rd pressure hPa : 220  
C-rod trav.mm : 12.90...13.10

SWITCH-OVER POINT

Speed 1/min : 170 (190)

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700  
Speed 1/min : 800  
Del. quantity cm<sup>3</sup>/ : 91.5...94.5  
1000H.: (89.5...96.5)  
Dispersion cm<sup>3</sup>/ : 4.00  
1000H.: (5.50)  
Charge press. hPa : -  
Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/ : 60.5...63.5  
1000H.: (58.5...65.5)  
Dispersion cm<sup>3</sup>/ : 4.00  
1000H.: 5.50

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : HAN 7,2 B 1  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 674 045  
Injection pump  
Pump designation : PE4A9SD42ORS2662-1  
EP type number : 0 10 694 994  
Governor  
Governor design. : RSV350...1100A8C2222  
R  
Governor no. : 0 420 232 487

Customer-spec. information  
Customer : HANOMAG

Engine : D944 T

1st version kW : 93.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 2- 4- 3

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1080

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 10.6...10.8

100H.: (10.4...11.0)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 7.4...7.6

Del.quantity cm<sup>3</sup>/ : 3.2...3.8

100H.: (2.9...4.0)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 3.75

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1080

Del.quantity cm<sup>3</sup>/ : 106.0...108.0

1000H.: (104.0...110.0)

Dispersion cm<sup>3</sup>/ : 3.50

1000H.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 44...52

Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1120...1130

2nd c-rod trav.mm : 4.00

Speed 1/min : 1140...1175

3rd c-rod trav.mm : 4.00

Speed 1/min : 1165...1195

4th speed 1/min : 1340

C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever  
position degrees: 13...21  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 7.0

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 7.40...7.60  
C-rod trav.mm : 2.00  
Speed 1/min : 490...550

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1080  
C-rod trav.mm : 11.00...11.10  
2nd speed 1/min : 500  
C-rod trav.mm : 11.90...12.00  
4th speed 1/min : 670  
C-rod trav.mm : 11.40...11.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 109.0...112.0  
1000h.: (106.5...114.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 132.0...142.0  
1000h.: (129.0...145.0)  
Contr.-rod trav.mm: 19.50...21.00

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : LIE 5,6 B  
 Edition : 13.05.87  
 Superceeded : 12.9.86  
 Calibrating oil : ISO-4113

Combination no. : 0 400 844 085

Injection pump  
 Pump designation : PES4A100D410RS2686  
 EP type number : 0 410 804 001  
 Governor  
 Governor design. : RQV400...1000AB1203L  
 Governor no. : 0 420 212 177

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904T

1st version kW : 100.0  
 Speed 1/min: 2000

**TEST BENCH REQUIREMENTS**

Calibrating-oil inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant. per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 3- 4- 2

SD ang. spacing<sup>0</sup>CS: 0-90-180-270  
 Tolerance + - <sup>0</sup> : 0.50 (0.75)

**START OF DELIVERY DIFFERENCE**

betw.c-rod trav.mm: 9.00...12.00  
 Difference <sup>0</sup> CS : 4.00...5.00

**BASIC SETTING**

1st speed 1/mi: 1000  
 -----  
 Contr.-rod trav.mm: 12.50...12.60  
 -----  
 Del.quantity cm3/ : 12.1...12.3  
 -----  
 100H.: (11.9...12.5)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.6)  
 -----  
 2nd speed 1/min: 400.0  
 Contr.-rod trav. m: 7.4...7.6  
 Del.quantity cm3/ : 1.5...2.1  
 100H.: (1.2...2.3)  
 Dispersion cm3/ : 0.3  
 100H.: (0.5)

(B) Setting of injection pump with externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 450  
 Sleeve travel mm: 4.20...4.40  
 2nd speed 1/min: 580  
 Sleeve travel mm: 3.60...3.90  
 3rd speed 1/min: 1040  
 Sleeve travel mm: 7.80...7.90  
 4th speed 1/min: 1140  
 Sleeve travel mm: 9.00...9.20

**SLEEVE POSITION**

Control-lever position  
 Degree: 1  
 Speed 1/min: 1000  
 Cont.-rod travelmm: 15.20...17.80

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version  
 Speed 1/min: 1000  
 Charge press. hPa : 800  
 Del.quantity cm3/ : 121.5...123.5  
 1000H.: (119.5...125.5)

Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (6.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 58...66

#### Testing:

1st c-rod trav.mm : 11.50  
Speed 1/min : 1040...1050  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1125...1155  
3rd c-rod trav.mm : 4.00  
4th speed 1/min : 1250  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 9...17

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.50  
Speed 1/min : 400  
C-rod trav.mm : 6.90...7.10

#### CONSTANT REGULATION

Speed 1/min : 435...540

#### TORQUE CONTROL

Dimension a mm : 1.30  
Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 12.50...12.60  
2nd speed 1/min : 500  
C-rod trav.mm : 13.80...13.90  
4th speed 1/min : 860  
C-rod trav.mm : 13.30...13.50  
5th speed 1/min : 920  
C-rod trav.mm : 12.90...13.10

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 800  
Contr.-rod trav.mm: 13.80...13.90

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 12.70...12.80  
2nd pressure hPa : 655  
C-rod trav.mm : 13.60...13.70  
3rd pressure hPa : 610  
C-rod trav.mm : 13.00...13.20

L14

#### SWITCH-OVER POINT

Speed 1/min : 320 (340)

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 800  
Speed 1/min : 650  
Del.quantity cm<sup>3</sup>/ : 133.5...136.5  
1000H.: (131.0...139.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/ : 104.0...107.0  
1000H.: (102.0...109.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 113.0...123.0  
1000H.: (110.0...126.0)  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 400  
Contr.-rod trav.mm: 7.40...7.60  
Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000H.: (12.5...23.5)  
Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 9,2 0 3  
Edition : 30.03.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 845 072  
  
Injection pump  
Pump designation : PESSA95D410LS2543  
EP type number : 0 410 895 978  
Governor  
Governor design. : RQV250...1100AB1177-  
1L  
Governor no. : 0 420 212 163  
  
Customer-spec. information  
Customer : MAN  
  
Engine : D2565 M/MF

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000  
  
Inlet press., bar : 1.00  
  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test inj. tubing : 1 680 750 003  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----  
  
START OF DELIVERY  
Test pressure, bar: 25...27  
  
Prestroke mm : 1.50...1.60  
                  : (1.45...1.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 5- 4- 2

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 5

#### BASIC SETTING

1st speed 1/mi: 1100  
-----  
Contr.-rod trav.mm: 11.00...11.10  
-----  
Del.quantity cm<sup>3</sup>/ : 11.0...11.2  
-----  
100H.: (10.8...11.4)  
-----  
Dispersion cm<sup>3</sup>/ : 0.3  
-----  
100H.: (0.6)  
-----  
2nd speed 1/min: 250.0  
Contr.-rod trav. m: 6.5...6.7  
Del.quantity cm<sup>3</sup>/ : 0.8...1.4  
100H.: (0.5...1.6)  
Dispersion cm<sup>3</sup>/ : 0.3  
100H.: (0.5)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 150  
Sleeve travel mm: 0.40...0.70  
2nd speed 1/min: 550  
Sleeve travel mm: 3.60...4.00  
3rd speed 1/min: 900  
Sleeve travel mm: 5.60...6.10  
4th speed 1/min: 1200  
Sleeve travel mm: 9.50...10.30

#### SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1140  
Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/ : 110.5...112.5  
1000H.: (108.5...114.5)  
Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (6.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 42...50

#### Testing:

1st c-rod trav.mm : 10.00  
Speed 1/min : 1140...1150  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1180...1210  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 8...16

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.10  
Speed 1/min : 250  
C-rod trav.mm : 6.50...6.70  
C-rod trav.mm : 2.00  
Speed 1/min : 335...395

#### TORQUE CONTROL

Dimension a mm : 0.35  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 11.00...11.10  
2nd speed 1/min : 500  
C-rod trav.mm : 11.40...11.50  
4th speed 1/min : 900  
C-rod trav.mm : 11.10...11.40

#### SWITCH-OVER POINT

Speed 1/min : 170 (190)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/ : 0.0...111.5  
1000H.: (0.0...113.5)  
Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/ : 106.5...110.5  
1000H.: (104.5...112.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 146.5...156.5  
1000H.: (143.5...159.5)  
Contr.-rod trav.mm: 16.90...17.50

#### Remarks:

Set idle stop at 250 min. -1 to a  
control-rod travel of 6.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OMB 8,1 A 1  
Edition : 26.06.87  
Superceeded : 5.84  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 846 396  
  
Injection pump  
Pump designation : PES6A90D41ORS2494  
EP type number : 0 410 896 057  
Governor  
Governor design. : RQ275/1300AB969DL  
Governer no. : 0 420 202 278

Customer-spec. information  
Customer : IVECO-0M

Engine : 8360.05.200

1st version kW : 117.7  
Speed 1/min: 2600

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1300

Contr.-rod trav.mm: 13.20...13.30

Del.quantity cm3/ : 8.0...8.1

100H.: (7.8...8.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 8.3...8.5

Del.quantity cm3/ : 0.4...0.9

100H.: (0.2...1.1)

Dispersion cm3/ : 0.4

100H.: (0.4)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 900

Cont.-rod travelmm: 13.60...15.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1300

Del.quantity cm3/ : 80.0...81.0

1000H.: (78.0...83.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

## HIGHEST RATED SPEED

Setting point:

Speed 1/min : 900

Contr.-rod trav.mm: 14.3

Testing:

1st c-rod trav.mm : 12.20

Speed 1/min : 1345...1360

2nd c-rod trav.mm : 4.00

Speed 1/min : 1440...1470

4th speed 1/min : 1600

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 275

Contr.-rod trav.mm: 5.8

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.30

Speed 1/min : 275

C-rod trav.mm : 5.70...5.90

C-rod trav.mm : 2.00

Speed 1/min : 420...480

Speed 1/min : 600

C-rod trav.mm max : 1.00

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1300

C-rod trav.mm : 13.20...13.30

2nd speed 1/min : 500

C-rod trav.mm : 13.80...13.90

3rd speed 1/min : 700

C-rod trav.mm : 13.70...13.90

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 71.5...74.5

1000H.: (69.0...77.0)

Speed 1/min : 700

Del.quantity cm3/ : 77.5...80.5

1000H.: (75.0...83.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 112.0...122.0

1000H.: (109.0...125.0)

Contr.-rod trav.mm: 19.50...21.00

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : MAN 11,1P14  
 Edition : 12.09.86  
 Superceeded : 10.85  
 Calibrating oil : ISO-4113

Combination no. : 0 400 846 419

Injection pump  
 Pump designation : PES6A95D410LS254Z  
 EP type number : 0 410 896 936  
 Governor  
 Governor design. : RQ250/1100AB965DL  
 Governor no. : 0 420 202 270

Customer-spec. information  
 Customer : MAN

Engine : D2566 M/MF

1st version kW : 176.5  
 Speed 1/min: 2200  
 2nd version kW : 168.0  
 Speed 1/min: 1500

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

**BASIC SETTING**

1st speed 1/mi: 1100

Contr.-rod trav.mm: 12.00...12.10

Del.quantity cm<sup>3</sup>/ : 12.4...12.6

100H.: (12.2...12.8)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.8...1.4

100H.: (0.5...1.6)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

**SLEEVE POSITION**

Control-lever position

Degree: -1

Speed 1/min: 600

Cont.-rod travelmm: 15.60...16.40

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1100

Del.quantity cm<sup>3</sup>/ : 124.5...126.5

1000H.: (122.5...128.5)

Dispersion cm<sup>3</sup>/ : 3.00

1000H.: (6.00)

2nd version

Speed 1/min: 1100

Del.quantity cm<sup>3</sup>/ : 118.0...120.0 \*

1000H.: (116.0...122.0)

**HIGHEST RATED SPEED**

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 11.00

Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1185...1215  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

Setting point:

Speed 1/min : 600  
Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 11.00  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1185...1215  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 250  
Contr.-rod trav.mm: 6.0

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.50  
Speed 1/min : 250  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 360...420  
Speed 1/min : 500  
C-rod trav.mm max : 1.00

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1100  
C-rod trav.mm : 12.00...12.10  
2nd speed 1/min : 500  
C-rod trav.mm : 12.00...12.20

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 107.5...113.5  
1000H.: (105.0...116.0)  
Speed 1/min : 750  
Del.quantity cm3/ : 110.5...113.5  
1000H.: (108.0...116.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 102.0...108.0 \*  
1000H.: (100.0...110.0)  
Speed 1/min : 750  
Del.quantity cm3/ : 106.0...109.0 \*  
1000H.: (104.0...111.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

L20

Del.quantity cm3/ : 125.0...135.0  
1000H.: (122.0...138.0)  
Contr.-rod trav.mm: 14.00...14.60

Remarks:

: MAN-NR. 2-7283

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RAB 9,7 B 1  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 846 543  
Injection pump  
Pump designation : PES6A95D420LS2595  
EP type number : 0 410 896 930  
Governor  
Governor design. : RQ200/1100AB1210R  
Governor no. : 0 420 201 643

Customer-spec. information  
Customer : RABA

Engine : D2156MT6U

1st version kW : 188.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 12.6...12.8

100H.: (12.4...13.0)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 200.0

Contr.-rod trav. m: 7.3...7.5

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100H.: (0.6...1.7)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

#### SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.60

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Charge press. hPa : 700

Del.quantity cm<sup>3</sup>/ : 126.5...128.5

1000H.: (124.5...130.5)

Dispersion cm<sup>3</sup>/ : 3.00

1000H.: (6.00)

#### HIGHEST RATED SPEED

Testing:

1st c-rod trav.mm : 11.60

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1190...1220

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 200

Contr.-rod trav.mm: 6.4

Testing:

L22

Speed 1/min : 100

C-rod trav.mm min : 7.60

Speed 1/min : 200

C-rod trav.mm : 6.30...6.50

C-rod trav.mm : 2.00

Speed 1/min : 320...360

Speed 1/min : 450

C-rod trav.mm max : 1.00

#### TORQUE CONTROL

Dimension a mm : 1.20

Torque-control curve - 1st version

1st speed 1/min : 1100

C-rod trav.mm : 12.60...12.70

2nd speed 1/min : 600

C-rod trav.mm : 13.80...14.00

3rd speed 1/min : 865

C-rod trav.mm : 13.40...13.70

4th speed 1/min : 985

C-rod trav.mm : 13.00...13.20

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.10...11.20

2nd pressure hPa : 340

C-rod trav.mm : 12.80...12.90

3rd pressure hPa : 250

C-rod trav.mm : 11.20...11.40

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700

Speed 1/min : 700

Del.quantity cm<sup>3</sup>/ : 135.0...138.0

1000H.: (133.0...140.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm<sup>3</sup>/ : 82.5...84.5

1000H.: (80.5...86.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 145.0...155.0

1000H.: (142.0...158.0)

Contr.-rod trav.mm: 17.00...17.40

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

Set idle stop at 250 min. -1 to a  
control-rod travel of 6.5 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A  
Edition : 12.09.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 846 547  
Injection pump  
Pump designation : PES6A90D41ORS2713  
EP type number : 0 410 896 083  
Governor  
Governor design. : RQV300...1350AB1175-  
1L  
Governor no. : 0 420 212 183

Customer-spec. information  
Customer : FIAT

Engine : 8060.25.661

1st version kW : 88.0  
Speed 1/min: 2700

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1350

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm<sup>3</sup>/ : 6.8...6.9

100H.: (6.6...7.1)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 9.7...9.9

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100H.: (1.0...2.0)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.90...1.10

2nd speed 1/min: 435

Sleeve travel mm: 2.40...2.60

3rd speed 1/min: 780

Sleeve travel mm: 4.20...4.40

4th speed 1/min: 1400

Sleeve travel mm: 8.10...8.20

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1430

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1350

Charge press. hPa : 700

Del.quantity cm<sup>3</sup>/ : 68.0...69.0

1000H.: (66.0...71.0)

Dispersion cm<sup>3</sup>/ : 3.00

1000H.: (5.00)

### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

#### Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1390...1400

2nd c-rod trav.mm : 4.00

Speed 1/min : 1515...1545

4th speed 1/min : 1650

C-rod trav.mm : 0.00...1.00

### LOWEST RATED SPEED I

Control-lever

position degrees: 14...21

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 11.20

Speed 1/min : 300

C-rod trav.mm : 9.70...9.90

### CONSTANT REGULATION

Speed 1/min : 350...450

### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1350

C-rod trav.mm : 11.70...11.80

2nd speed 1/min : 500

C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.40...11.50

2nd pressure hPa : 260

C-rod trav.mm : 11.60...11.70

### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700

Speed 1/min : 800

Del.quantity cm3/ : 57.5...59.5

1000H.: (55.0...62.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 46.5...48.5

1000H.: (44.5...50.5)

### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 46.5...48.5

1000H.: (44.5...50.5)

Contr.-rod trav.mm: 18.10...18.50

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A 1  
Edition : 12.09.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 846 550  
Injection pump  
Pump designation : PES6A90D41ORS2713  
EP type number : 0 410 896 083  
Governor  
Governor design. : RQV300...1350AB1175-3L  
Governor no. : 0 420 212 192  
Customer-spec. information  
Customer : FIAT  
Engine : 8060.25.640

1st version kW : 103.0  
Speed 1/min: 2700

## TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42  
Overflow valve : 1 417 413 000  
Inlet press., bar : 1.00  
Calibrating nozzle-holder assembly : 0 681 343 009  
Opening pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant. per values -----

## START OF DELIVERY

Test pressure, bar: 25...27  
Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1350  
-----  
Contr.-rod trav.mm: 11.70...11.80  
-----  
Del.quantity cm<sup>3</sup>/ : 6.8...6.9  
-----  
100H.: (6.6...7.1)  
-----  
Dispersion cm<sup>3</sup>/ : 0.3  
-----  
100H.: (0.5)  
-----

2nd speed 1/min: 300.0  
Contr.-rod trav. m: 9.7...9.9  
Del.quantity cm<sup>3</sup>/ : 1.2...1.8  
100H.: (1.0...2.0)  
Dispersion cm<sup>3</sup>/ : 0.2  
100H.: (0.4)

(B) Setting of injection pump with externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
Sleeve travel mm: 0.90...1.10  
2nd speed 1/min: 435  
Sleeve travel mm: 2.40...2.60  
3rd speed 1/min: 780  
Sleeve travel mm: 4.20...4.40  
4th speed 1/min: 1400  
Sleeve travel mm: 8.10...8.20

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1430  
Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1350  
Charge press. hPa : 700  
Del.quantity cm<sup>3</sup>/ : 68.5...69.5  
1000H.: (66.5...71.5)  
Dispersion cm<sup>3</sup>/ : 3.00  
1000H.: (5.00)



### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 55...63

#### Testing:

1st c-rod trav.mm : 10.70  
Speed 1/min : 1390...1400  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1515...1545  
4th speed 1/min : 1650  
C-rod trav.mm : 0.00...1.00

### LOWEST RATED SPEED I

Control-lever  
position degrees: 14...21

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 11.20  
Speed 1/min : 300  
C-rod trav.mm : 9.70...9.90

### CONSTANT REGULATION

Speed 1/min : 350...450

### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1350  
C-rod trav.mm : 11.70...11.80  
2nd speed 1/min : 500  
C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.70...11.80

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 11.20...11.30  
2nd pressure hPa : 260  
C-rod trav.mm : 11.40...11.50

### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700  
Speed 1/min : 800  
Del.quantity cm3/ : 59.0...61.0  
1000H.: (56.5...63.5)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 44.0...46.0  
1000H.: (42.0...48.0)

### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 105.0...115.0  
1000H.: (102.0...118.0)  
Contr.-rod trav.mm: 18.10...18.50

#### Remarks:

Test electrically-released starting  
quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 B  
Edition : 13.05.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 400 846 551  
Injection pump  
Pump designation : PES6A90D410RS2723  
EP type number : 0 410 896 085  
Governor  
Governor design. : RQV300...1500AB1152-1L  
Governor no. : 0 420 212 195

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8060.05.661

1st version kW : 81.0  
Speed 1/min: 3000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
                  : (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1500

Contr.-rod trav.mm: 9.00...9.10

Del.quantity cm<sup>3</sup>/ : 4.7...4.8

100H.: (4.5...5.0)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.4)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.2...8.4

Del.quantity cm<sup>3</sup>/ : 1.0...1.6

100H.: (0.8...1.8)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 345

Sleeve travel mm: 2.20...2.40

2nd speed 1/min: 410

Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 630

Sleeve travel mm: 4.30...4.70

4th speed 1/min: 1545

Sleeve travel mm: 8.60...8.70

5th speed 1/min: 1650

Sleeve travel mm: 9.30...9.50

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1525

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1500

Del.quantity cm<sup>3</sup>/ : 47.5...48.5

1000H.: (45.5...50.5)

Dispersion cm<sup>3</sup>/ : 3.00

1000H.: (4.50)

HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

Testing:

1st c-rod trav.mm : 8.00

Speed 1/min : 1540...1550

2nd c-rod trav.mm : 4.00

Speed 1/min : 1635...1665

4th speed 1/min : 1800

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 15...23

Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.00

Speed 1/min : 300

C-rod trav.mm : 8.20...8.40

CONSTANT REGULATION

Speed 1/min : 330...430

TORQUE CONTROL

Dimension a mm : 1.30

Torque-control curve - 1st version

1st speed 1/min : 1500

C-rod trav.mm : 9.00...9.10

2nd speed 1/min : 500

C-rod trav.mm : 10.30...10.40

3rd speed 1/min : 785

C-rod trav.mm : 9.90...10.10

4th speed 1/min : 1210

C-rod trav.mm : 9.30...9.50

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 43.0...45.0

1000H.: (40.5...47.5)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 95.0...105.0

1000H.: (92.0...108.0)

Contr.-rod trav.mm: 15.70...16.10

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : FIA 5,9 A 2  
 Edition : 15.05.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 846 557  
 Injection pump  
 Pump designation : PES6A90D410RS2713  
 EP type number : 0 410 896 083  
 Governor  
 Governor design. : RQV300...1350AB1175-  
 SL  
 Govenner no. : 0 420 212 199  
 Customer-spec. information  
 Customer : FIAT -

Engine : 8060.25.630

**TEST BENCH REQUIREMENTS**

Calibrating-gil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.00  
 Calibrating nozzle-holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test inj. tubing : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 2.20...2.30  
 : (2.15...2.35)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

**BASIC SETTING**

1st speed 1/mi: 1350  
 -----  
 Contr.-rod trav.mm: 11.50...11.60  
 -----  
 Del.quantity cm3/ : 7.6...7.7  
 -----  
 100H.: (7.4...7.9)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.5)  
 -----  
 2nd speed 1/min: 300.0  
 Contr.-rod trav. m: 8.4...8.6  
 Del.quantity cm3/ : 1.0...1.6  
 100H.: (0.8...1.8)  
 Dispersion cm3/ : 0.2  
 100H.: (0.4)

(B) Setting of injection pump with  
 externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 300  
 Sleeve travel mm: 0.80...0.90  
 2nd speed 1/min: 435  
 Sleeve travel mm: 2.30...2.70  
 3rd speed 1/min: 660  
 Sleeve travel mm: 3.80...4.20  
 4th speed 1/min: 1395  
 Sleeve travel mm: 7.70...7.80

**SLEEVE POSITION**

Control-lever position  
 Degree: -1  
 Speed 1/min: 1470  
 Cont.-rod travelmm: 15.20...17.80

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version  
 Speed 1/min: 1350  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 76.5...77.5  
 1000H.: (74.5...79.5)  
 Dispersion cm3/ : 3.00  
 1000H.: (5.00)

**HIGHEST RATED SPEED**

1st version

Control-lever  
position degrees: 54...62

Testing:  
1st c-rod trav.mm : 10.50  
Speed 1/min : 1390...1400  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1520...1550  
4th speed 1/min : 1650  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 10...18

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 9.90  
Speed 1/min : 300  
C-rod trav.mm : 8.40...8.60

CONSTANT REGULATION  
Speed 1/min : 360...460

TORQUE CONTROL  
Torque-control curve - 1st version  
1st speed 1/min : 1350  
C-rod trav.mm : 11.50...11.60  
2nd speed 1/min : 500  
C-rod trav.mm : 11.50...11.70

compensator (LDA,ADA,ALDA)

1st version  
Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.50...11.60

Measurement  
Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 10.50...10.60  
2nd pressure hPa : 348  
C-rod trav.mm : 11.30...11.40  
3rd pressure hPa : 330  
C-rod trav.mm : 10.90...11.10

FUEL-DELIVERY CHARACTERISTICS  
Charge press. hPa : 700  
Speed 1/min : 800  
Del.quantity cm3/ : 68.5...70.5  
1000H.: (66.0...73.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 47.0...49.0  
1000H.: (45.0...51.0)

## STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 115.0...125.0  
1000H.: (112.0...128.0)  
Contr.-rod trav.mm: 17.10...17.50

Test electrically-released starting  
quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 A 4  
 Edition : 03.04.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 846 563  
 Injection pump  
 Pump designation : PES6A90D410RS2667  
 EP type number : 0 410 896 080  
 Governor  
 Governor design. : RQV300...1200AB1065-15L  
 Governor no. : 0 420 212 210

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 366  
 1st version kW : 92.0

## TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant. per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)  
 Contr.-rod trav.mm: 9.00...12.00

M04

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1200  
 -----  
 Contr.-rod trav.mm: 11.10...11.20  
 -----  
 Del.quantity cm<sup>3</sup>/ : 5.8...5.9  
 -----  
 100H.: (5.6...6.1)  
 -----  
 Dispersion cm<sup>3</sup>/ : 0.3  
 -----  
 100H.: (0.5)  
 -----  
 2nd speed 1/min: 300.0  
 Contr.-rod trav. m: 8.9...9.1  
 Del.quantity cm<sup>3</sup>/ : 0.9...1.3  
 100H.: (0.7...1.5)  
 Dispersion cm<sup>3</sup>/ : 0.2  
 100H.: (0.4)

(B) Setting of injection pump with externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
 Sleeve travel mm: 0.80...1.30  
 2nd speed 1/min: 500  
 Sleeve travel mm: 2.30...2.80  
 3rd speed 1/min: 750  
 Sleeve travel mm: 4.30...4.70  
 4th speed 1/min: 1260  
 Sleeve travel mm: 8.40...8.60

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 1260  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1200  
 Del.quantity cm<sup>3</sup>/ : 58.0...59.0  
 1000H.: (56.0...61.0)  
 Dispersion cm<sup>3</sup>/ : 3.00  
 1000H.: (5.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 56...64

Testing:

1st c-rod trav.mm : 10.10  
Speed 1/min : 1240...1250  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1330...1360  
4th speed 1/min : 1500  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 16...24

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 10.30  
Speed 1/min : 300  
C-rod trav.mm : 8.90...9.10

CONSTANT REGULATION

Speed 1/min : 540...680

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200  
C-rod trav.mm : 11.10...11.20  
2nd speed 1/min : 600  
C-rod trav.mm : 12.30...12.40  
3rd speed 1/min : 900  
C-rod trav.mm : 11.80...12.00  
4th speed 1/min : 1000  
C-rod trav.mm : 11.30...11.60

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 54.0...56.0  
1000H.: (51.5...58.5)  
Speed 1/min : 900  
Del.quantity cm3/ : 56.0...59.0  
1000H.: (53.5...61.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 17.00...17.40

Remarks:

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 4,1 D  
Edition : 13.05.87  
Superceeded : 1.86  
Calibrating oil : ISO-4113  
Combination no. : 0 400 864 063  
Injection pump  
Pump designation : PES4A85D410/3RS2638  
EP type number : 0 410 884 950  
Governor  
Governor design. : RSV325...1400A8C707-  
3L  
Governor no. : 0 420 232 440  
Customer-spec. information  
Customer : KHD

Engine : BF4L913

1st version kW : 78.0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
: (2.45...2.65)



Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1250  
-----  
Contr.-rod trav.mm: 12.70...12.80  
-----

Del.quantity cm3/ : 8.2...8.3  
-----  
100H.: (8.0...8.5)  
-----

Dispersion cm3/ : 0.3  
-----  
100H.: (0.4)  
-----

2nd speed 1/min: 325.0  
Contr.-rod trav. m: 8.4...8.6  
Del.quantity cm3/ : 0.8...1.4  
100H.: (0.6...1.6)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 4.00

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1250  
Charge press. hPa : 700  
Del.quantity cm3/ : 82.5...83.5  
1000H.: (80.5...85.5)  
Dispersion cm3/ : 3.00  
1000H.: (4.50)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 49...57

Testing:  
1st c-rod trav.mm : 11.70  
Speed 1/min : 1290...1300  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1315...1345  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1360...1390

M07

4th speed 1/min : 1540  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 9...17  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 8.0  
Speed 1/min : 325  
C-rod trav.mm : 8.40...8.60  
C-rod trav.mm : 2.00  
Speed 1/min : 620...680

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 12.70...12.80  
2nd speed 1/min : 500  
C-rod trav.mm : 13.70...13.80  
3rd speed 1/min : 850  
C-rod trav.mm : 13.50...13.60  
4th speed 1/min : 950  
C-rod trav.mm : 13.20...13.40

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 13.70...13.80

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 12.30...12.40  
2nd pressure hPa : 390  
C-rod trav.mm : 13.50...13.60  
3rd pressure hPa : 250  
C-rod trav.mm : 12.80...13.00

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700  
Speed 1/min : 850  
Del.quantity cm3/ : 84.5...86.5  
1000H.: (82.0...89.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 59.5...61.5  
1000H.: (57.5...63.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 95.0...105.0  
1000H.: (92.0...108.0)

Contr.-rod trav.mm: 17.10...17.30

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 A 5  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 866 080  
Injection pump  
Pump designation : PES6A85D410/3RS2415  
EP type number : 0 410 886 915  
Governor  
Governor design. : RSV325...1400A8C707-4L  
Governor no. : 0 420 232 461

Customer-spec. information  
Customer : KHD

Engine : BF6L913

## TEST BENCH REQUIREMENTS

Calibrating-oil inlet temp. °C : 38...42  
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
                  : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 10.80...10.90

Del.quantity cm3/ : 7.6...7.7

100H.: (7.4...7.9)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 7.9...8.1

Del.quantity cm3/ : 0.9...1.5

100H.: (0.7...1.7)

Dispersion cm3/ : 0.2

100H.: (0.4)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 5.25

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Charge press. hPa : 700

Del.quantity cm3/ : 76.0...77.0

1000H.: (74.0...79.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 65...73

Testing:

1st c-rod trav.mm : 9.80

Speed 1/min : 1440...1450

2nd c-rod trav.mm : 4.00

Speed 1/min : 1470...1500

3rd c-rod trav.mm : 4.00

Speed 1/min : 1505...1535

4th speed 1/min : 1600

C-rod trav.mm : 0.30...1.40

### LOWEST RATED SPEED I

Control-lever  
position degrees: 14...22  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 7.5

### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 7.90...8.10  
C-rod trav.mm : 2.00  
Speed 1/min : 600...660

### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1400  
C-rod trav.mm : 10.80...10.90  
2nd speed 1/min : 500  
C-rod trav.mm : 12.00...12.10  
3rd speed 1/min : 1040  
C-rod trav.mm : 11.40...11.60

compensator (LDA,ADA,ALDA)

### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 12.00...12.10

### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 10.50...10.60  
2nd pressure hPa : 360  
C-rod trav.mm : 11.70...11.80  
3rd pressure hPa : 95  
C-rod trav.mm : 10.60...10.80

### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 44.0...47.0  
1000H.: (42.0...49.0)

### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 105.0...115.0  
1000H.: (102.0...118.0)  
Contr.-rod trav.mm: 17.10...17.30

### LOW IDLE

M10

Speed 1/min : 325  
Contr.-rod trav.mm: 7.90...8.10  
Del.quantity cm3/ : 9.5...15.5  
1000H.: (7.5...17.5)  
Dispersion cm3/ : 2.00  
1000H.: (4.00)

### Remarks:

Test electrically-released starting quantity (EES) with 12 volts  
The stop position of the control rod must be easily reached with the stop lever

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 A 7  
 Edition : 13.05.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 866 120  
 Injection pump  
 Pump designation : PES6A85D410/3RS2415  
 EP type number : 0 410 886 915  
 Governor  
 Governor design. : RSV325...1150A8C673-  
 1L  
 Govenner no. : 0 420 232 489

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1150  
 -----  
 Contr.-rod trav.mm: 11.00...11.10  
 -----  
 Del.quantity cm3/ : 6.8...6.9  
 -----  
 100H.: (6.6...7.1)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.4)  
 -----  
 2nd speed 1/min: 325.0  
 Contr.-rod trav. m: 8.0...8.2  
 Del.quantity cm3/ : 0.9...1.5  
 100H.: (0.7...1.7)  
 Dispersion cm3/ : 0.2  
 100H.: (0.4)

## SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed 1/min: 800  
 Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 4.30

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1150  
 Del.quantity cm3/ : 68.0...69.0  
 1000H.: (66.0...71.0)  
 Dispersion cm3/ : 3.00  
 1000H.: (4.50)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 49...57

Testing:  
 1st c-rod trav.mm : 10.00  
 Speed 1/min : 1190...1200  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1215...1245  
 3rd c-rod trav.mm : 4.00  
 Speed 1/min : 1235...1265  
 4th speed 1/min : 1400  
 C-rod trav.mm : 0.30...1.40

## LOWEST RATED SPEED I

Control-lever  
position degrees: 13...21  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 5.0

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 2.00  
Speed 1/min : 505...565

TORQUE CONTROL  
Torque-control curve - 1st version  
1st speed 1/min : 1150  
C-rod trav.mm : 11.00...11.10  
2nd speed 1/min : 500  
C-rod trav.mm : 11.70...11.80  
4th speed 1/min : 990  
C-rod trav.mm : 11.30...11.50

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 100.0...110.0  
1000H.: (97.0...113.0)  
Contr.-rod trav.mm: 16.70...17.30

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 M 12  
Edition : 22.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 876 108  
  
Injection pump  
Pump designation : PES6A80D41ORS2085X  
EP type number : 0 410 886 045  
Governor  
Governor design. : RSV350...1425A2C1001  
L  
Governor no. : 0 420 232 464

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM352

1st version kW : 66.0  
Speed 1/min: 2850

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>D</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 8.50...8.60

Del.quantity cm<sup>3</sup>/ : 4.1...4.2

100H.: (4.0...4.4)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 7.4...7.6

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100H.: (0.8...1.5)

Dispersion cm<sup>3</sup>/ : 0.2

100H.: (0.3)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload  
Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Del.quantity cm<sup>3</sup>/ : 41.5...42.5

1000H.: (40.0...44.0)

Dispersion cm<sup>3</sup>/ : 2.00

1000H.: (3.50)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 46...54

Testing:

1st c-rod trav.mm : 7.50

Speed 1/min : 1455...1465

2nd c-rod trav.mm : 4.00

Speed 1/min : 1475...1505

3rd c-rod trav.mm : 4.00

Speed 1/min : 1525...1555

4th speed 1/min : 1600

C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 7.5

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 7.40...7.60

C-rod trav.mm : 2.00

Speed 1/min : 730...790

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1400

C-rod trav.mm : 8.50...8.60

2nd speed 1/min : 500

C-rod trav.mm : 9.80...9.90

3rd speed 1/min : 800

C-rod trav.mm : 8.80...9.10

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 40.5...42.5

1000H.: (38.5...44.5)

Speed 1/min : 800

Del.quantity cm3/ : 39.0...41.0

1000H.: (37.0...43.0)

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

Remarks:



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : RAB 9,7 D  
 Edition : 22.05.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 876 251  
 Injection pump  
 Pump designation : PES6A95D41ORS2108  
 EP type number : 0 410 896 983  
 Governor  
 Governor design. : RSV450...1050A1C607L  
 Govenrer no. : 0 420 232 381

Customer-spec. information  
 Customer : RABA

Engine : D2156 HMT6

1st version kW : 180.0  
 Speed 1/min: 2100

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27  
 Prestroke mm : 1.70...1.80  
 : (1.65...1.85)  
 Contr.-rod trav.mm: 9.00...12.00

M15

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

**BASIC SETTING**

1st speed 1/mi: 1050

Contr.-rod trav.mm: 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100H.: (13.1...13.7)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

2nd speed 1/min: 450.0

Contr.-rod trav. m: 6.2...6.4

Del.quantity cm<sup>3</sup>/ : 1.1...1.7

100H.: (0.8...1.9)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

**SLEEVE POSITION**

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 4.50

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1050

Del.quantity cm<sup>3</sup>/ : 133.5...135.5

1000H.: (131.5...137.5)

Dispersion cm<sup>3</sup>/ : 3.50

1000H.: (5.50)

**HIGHEST RATED SPEED**

1st version

Control-lever

position degrees: 50...58

Testing:

1st c-rod trav.mm : 12.60

Speed 1/min : 1090...1100

2nd c-rod trav.mm : 4.00

Speed 1/min : 1125...1155

3rd c-rod trav.mm : 4.00

Speed 1/min : 1160...1190

4th speed 1/min : 1300  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 22...30  
Setting point w/out aux. spring  
Speed 1/min : 450  
Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 450  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 560...620

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1050  
C-rod trav.mm : 13.60...13.70  
2nd speed 1/min : 500  
C-rod trav.mm : 13.60...13.80  
3rd speed 1/min : 300  
C-rod trav.mm : 14.40...15.00

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/ : 131.5...135.5  
1000H.: (129.5...137.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 193.0...203.0  
1000H.: (190.0...206.0)  
Contr.-rod trav.mm: 19.50...21.00

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 D1  
Edition : 7.86  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 876 270  
Injection pump  
Pump designation : PES6A85D410/3RS2537  
Governor  
Governor design. : RSV325...1150A8B2020  
DL

Customer-spec. information  
Customer : KHD

Engine : BF 6 L 913

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Inlet press., bar : 1.0  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6,00x2,00x600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Prestroke mm : 1,9...2,0  
                  : (1,85...2,05)  
Cam sequence : 1-5-3-6-2-4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0,5 (0,75)

## BASIC SETTING

M17

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11,0...11,1

Del.quantity cm<sup>3</sup>/ : 7,8...7,9

Dispersion cm<sup>3</sup>/ : 0,30

100H.: (0,45)

2nd speed 1/min: 325

Contr.-rod trav. m: 6,8...7,0

Del.quantity cm<sup>3</sup>/ : 1,0...1,6

Dispersion cm<sup>3</sup>/ : 0,20

100H.: (0,40)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0,3...1,0

Governor-spring reload

Notch setting x : -

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Charge press. hPa : 650

Del.quantity cm<sup>3</sup>/ : 78,0...79,0

1000H.: (76,0...81,0)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 10,0

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4,0

Speed 1/min : 1225...1255

4th speed 1/min : 1350

C-rod trav.mm : 0,3...1,7

## LOWEST RATED SPEED I

Control-lever

position degrees: 17...25

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 5,0

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19,0

Speed 1/min : 325

C-rod trav.mm : 5,4...5,6

C-rod trav.mm : 2,0

Speed 1/min : 510...570

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 12,6...12,8

Measurement

Speed 1/min : 500

1st pressure hPa : 370  
C-rod trav.mm : 12,2...12,3  
2nd pressure hPa : 90  
C-rod trav.mm : 10,6...10,9  
C-rod trav.mm : 10,6...10,7

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 650  
Speed 1/min : 800  
Del.quantity cm3/ : 80,0...82,0  
1000H.: (77,5...84,5)  
Speed 1/min : 500  
Del.quantity cm3/ : 61,0...63,0  
1000H.: (58,5...65,5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120,0...130,0

#### LOW IDLE

Speed 1/min : 325  
Del.quantity cm3/ : 10,0...16,0

Remarks:

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : KHD 6,1 D 4  
 Edition : 15.05.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 876 270  
 Injection pump  
 Pump designation : PES6A85D41ORS2537  
 EP type number : 0 410 886 908  
 Governor  
 Governor design. : RSV325...1150A8C2020  
 L  
 Govenner no. : 0 420 232 345

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

1st version kW : 106.6  
 Speed 1/min: 2300

**TEST BENCH REQUIREMENTS**

Calibrating-oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SP ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

**BASIC SETTING**

1st speed 1/mi: 1150

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 7.9...8.1

100H.: (7.7...8.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.8...7.0

Del.quantity cm3/ : 0.9...1.5

100H.: (0.7...1.7)

Dispersion cm3/ : 0.2

100H.: (0.4)

**SLEEVE POSITION**

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 6.00

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1150

Charge press. hPa : 500

Del.quantity cm3/ : 79.5...81.5

1000H.: (77.5...83.5)

Dispersion cm3/ : 3.00

1000H.: (4.50)

**HIGHEST RATED SPEED**

1st version

Control-lever

position degrees: 56...64

Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1240...1270

3rd c-rod trav.mm : 4.00

Speed 1/min : 1270...1300

4th speed 1/min : 1435  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever:  
position degrees: 20...28  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 6.4

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 6.80...7.00  
C-rod trav.mm : 2.00  
Speed 1/min : 590...650

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1150  
C-rod trav.mm : 11.00...11.10  
2nd speed 1/min : 960  
C-rod trav.mm : 11.70...11.90  
3rd speed 1/min : 500  
C-rod trav.mm : 12.50...12.60

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 12.50...12.60

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 10.60...10.70  
2nd pressure hPa : 370  
C-rod trav.mm : 12.20...12.30  
3rd pressure hPa : 90  
C-rod trav.mm : 10.60...10.90

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 500  
Speed 1/min : 850  
Del.quantity cm3/ : 88.0...91.0  
1000H.: (86.0...93.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 60.0...63.0  
1000H.: (58.0...65.0)

#### STARTING FUEL DELIVERY

M20

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 17.40...18.00

#### Remarks:

APPLICATION  
Tractor (tractor engines)

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : MB 5,7 W 11  
 Edition : 30.03.87  
 Superceeded : 11.84  
 Calibrating oil : ISO-4113

Combination no. : 0 400 876 325

Injection pump  
 Pump designation : PES6A90D41ORS2569  
 EP type number : 0 410 896 071  
 Governor  
 Governor design. : RSV350...1200A0B1140  
 -1L  
 Governer no. : 0 420 232 430

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 352

1st version kW : 70.0  
 Speed 1/min: 2400

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
 : (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

**BASIC SETTING**

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm3/ : 4.3...4.4

100H.: (4.1...4.6)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.9)

Dispersion cm3/ : 0.2

100H.: (0.4)

**SLEEVE POSITION**

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 3.75

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1200

Del.quantity cm3/ : 43.0...44.0

1000H.: (41.0...46.0)

Dispersion cm3/ : 3.00

1000H.: (5.00)

**HIGHEST RATED SPEED**

1st version

Control-lever

position degrees: 54...62

Testing:

1st c-rod trav.mm : 8.30

Speed 1/min : 1230...1240

2nd c-rod trav.mm : 4.00

Speed 1/min : 1255...1285

3rd c-rod trav.mm : 4.00

Speed 1/min : 1325...1355

4th speed 1/min : 1480

C-rod trav.mm : 0.30...1.70  
5th speed 1/min : 1245...1255  
C-rod trav.mm : 8.30

LOWEST RATED SPEED I

Control-lever  
position degrees: -

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 8.40...8.60  
C-rod trav.mm : 2.00  
Speed 1/min : 570...630

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1200  
C-rod trav.mm : 9.30...9.40  
2nd speed 1/min : 850  
C-rod trav.mm : 10.60...10.70  
3rd speed 1/min : 950  
C-rod trav.mm : 10.30...10.50  
4th speed 1/min : 1100  
C-rod trav.mm : 9.50...9.70

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 850  
Del.quantity cm3/ : 49.0...52.0  
1000H.: (46.5...54.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 16.10...16.50

Remarks:

APPLICATION  
Unimog



**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : DAF 6,2 0 3  
 Edition : 13.05.87  
 Superceeded : 12.9.86  
 Calibrating oil : ISO-4113

Combination no. : 0 400 876 327

Injection pump  
 Pump designation : PES6A95D32ORS2693  
 EP type number : 0 410 896 914  
 Governor  
 Governor design. : RSV300...1300AOC2195  
 R  
 Govenner no. : 0 420 233 200

Customer-spec. information  
 Customer : DAF

Engine : DNT 620

1st version kW : 130.0  
 Speed 1/min: 2600

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

M23

Contr.-rod trav.mm: 7.50...10.50  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

**START OF DELIVERY DIFFERENCE**

betw.c-rod trav.mm: 8.50...9.50  
 Difference<sup>o</sup> CS : 2.50...3.50

**BASIC SETTING**

1st speed 1/mi: 850  
 -----  
 Contr.-rod trav.mm: 11.50...11.60  
 -----  
 Del.quantity cm3/ : 7.6...7.7  
 -----  
 100H.: (7.4...7.9)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.4)  
 -----

2nd speed 1/min: 300.0  
 Contr.-rod trav. m: 6.4...6.6  
 Del.quantity cm3/ : 0.7...1.1  
 100H.: (0.4...1.3)  
 Dispersion cm3/ : 0.3  
 100H.: (0.5)

**SLEEVE POSITION**

Control-lever position  
 Degree: -3  
 Speed 1/min: 800  
 Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 6.00

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version  
 Speed 1/min: 850  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 76.5...77.5  
 1000H.: (74.5...79.5)  
 Dispersion cm3/ : 3.50  
 1000H.: (4.50)

**HIGHEST RATED SPEED**

1st version  
 Control-lever  
 position degrees: 58...66

Testing:

1st c-rod trav.mm : 9.70  
Speed 1/min : 1340...1350  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1400...1430  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1425...1455  
4th speed 1/min : 1570  
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever  
position degrees: 27...35  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 6.0  
Speed 1/min : 300  
C-rod trav.mm : 6.40...6.60  
C-rod trav.mm : 2.00  
Speed 1/min : 595...655

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1290  
C-rod trav.mm : 10.70...10.80  
2nd speed 1/min : 500  
C-rod trav.mm : 11.50...11.60  
4th speed 1/min : 1050  
C-rod trav.mm : 10.90...11.10

compensator (LDA,ADA,ALDA)

1st version

Setting  
Speed 1/min : 600  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.50...11.60

Measurement

Speed 1/min : 600  
1st pressure hPa : -  
C-rod trav.mm : 11.20...11.40  
2nd pressure hPa : 250  
C-rod trav.mm : 11.40...11.50

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700  
Speed 1/min : 1290  
Del.quantity cm<sup>3</sup>/ : 72.0...74.0  
1000H.: (69.5...76.5)  
Charge press. hPa : -  
Speed 1/min : 600  
Del.quantity cm<sup>3</sup>/ : 65.5...66.5  
1000H.: (63.5...68.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...145.0  
1000H.: (127.0...148.0)  
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000H.: (4.5...13.5)  
Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 C 2  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 876 335  
Injection pump  
Pump designation : PES6A90D410RS2710  
EP type number : 0 410 896 082  
Governor  
Governor design. : RSV350...1200A1C1154  
Governor no. : 0 420 232 468

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 74.0  
Speed 1/min: 2400

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>D</sup>CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.30...9.40

Del.quantity cm<sup>3</sup>/ : 4.8...4.9  
100H.: (4.6...5.1)

Dispersion cm<sup>3</sup>/ : 0.3  
100H.: (0.4)

2nd speed 1/min: 350.0  
Contr.-rod trav. m: 8.0...8.6  
Del.quantity cm<sup>3</sup>/ : 1.0...1.2  
100H.: (0.8...1.4)  
Dispersion cm<sup>3</sup>/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Cont.-rod travelmm: 0.03...1.00

Governor-spring reload  
Notch setting x : 5.00

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1200  
Del.quantity cm<sup>3</sup>/ : 48.0...49.0  
1000H.: (46.0...51.0)  
Dispersion cm<sup>3</sup>/ : 3.00  
1000H.: (4.50)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 59...67

#### Testing:

1st c-rod trav.mm : 8.30  
Speed 1/min : 1240...1245  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1261...1274  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1300...1330  
4th speed 1/min : 1400

C-rod trav.mm : 0.30...1.40  
5th speed 1/min : 1255...1265  
C-rod trav.mm : 8.30

#### LOWEST RATED SPEED I

Control-lever  
position degrees: ?

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 8.20...8.40  
C-rod trav.mm : 2.00  
Speed 1/min : 465...525

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1200  
C-rod trav.mm : 9.30...9.40  
2nd speed 1/min : 600  
C-rod trav.mm : 10.40...10.60  
3rd speed 1/min : 800  
C-rod trav.mm : 10.30...10.50  
4th speed 1/min : 1000  
C-rod trav.mm : 9.40...9.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm<sup>3</sup>/ : 41.0...43.0  
1000H.: (38.5...45.5)  
Speed 1/min : 900  
Del.quantity cm<sup>3</sup>/ : 44.0...47.0  
1000H.: (41.5...49.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 16.80...17.20

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 8.00...8.60  
Del.quantity cm<sup>3</sup>/ : 10.0...12.0  
1000H.: (8.0...14.0)  
Dispersion cm<sup>3</sup>/ : 2.50  
1000H.: (4.50)

Remarks:  
APPLICATION  
Unimog

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 C 3  
Edition : 13.05.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 876 336  
  
Injection pump  
Pump designation : PES6A90D41DRS2710  
EP type number : 0 410 896 082  
Governor  
Governor design. : RSV350...1200A1C115  
-1L  
Governor no. : 0 420 232 470  
  
Customer-spec. information  
Customer : DAIMLER-BENZ  
  
Engine : OM 366  
  
1st version kW : 81.0  
Speed 1/min: 2400

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000  
  
Inlet press., bar : 1.00  
  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test inj. tubing : 1 680 750 015  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1200

Contr.-rod trav.mm: 9.80...9.90

Del.quantity cm3/ : 5.1...5.2

100H.: (4.9...5.4)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.0...1.2

100H.: (0.8...1.4)

Dispersion cm3/ : 0.2

100H.: (0.4)

#### SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 5.00

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1200

Del.quantity cm3/ : 51.0...52.0

1000H.: (49.0...54.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 59...67

Testing:

1st c-rod trav.mm : 8.80

Speed 1/min : 1240...1245

2nd c-rod trav.mm : 4.00

Speed 1/min : 1262...1275

3rd c-rod trav.mm : 4.00

Speed 1/min : 1305...1335

4th speed 1/min : 1400

M28

C-rod trav.mm : 0.30...1.40  
5th speed 1/min : 1250...1260  
C-rod trav.mm : 8.80

#### LOWEST RATED SPEED I

Control-lever

position degrees: -3

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 8.50

Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 8.40...8.60

C-rod trav.mm : 2.00

Speed 1/min : 520...550

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1200

C-rod trav.mm : 9.80...9.90

2nd speed 1/min : 600

C-rod trav.mm : 11.30...11.40

3rd speed 1/min : 850

C-rod trav.mm : 11.10...11.30

4th speed 1/min : 950

C-rod trav.mm : 10.30...10.60

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 48.0...50.0

1000H.: (45.5...52.5)

Speed 1/min : 850

Del.quantity cm3/ : 49.0...52.0

1000H.: (46.5...54.5)

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

#### LOW IDLE

Speed 1/min : 350

Contr.-rod trav.mm: 8.10...8.80

Del.quantity cm3/ : 10.0...12.0

1000H.: (8.0...14.0)

Dispersion cm3/ : 2.50

1000H.: (84.50)

Remarks:

APPLICATION

Unimog



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 V 19  
Edition : 10.04.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 876 338  
Injection pump  
Pump designation : PES6A90D410RS2596  
EP type number : 0 410 896 073  
Governor  
Governor design. : RSV300...1100A0C1148  
-2L  
Governor no. : 0 420 232 477

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM352

1st version kW : 92.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)



Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1100  
-----  
Contr.-rod trav.mm: 10.90...11.00  
-----  
Del.quantity cm<sup>3</sup>/ : 6.3...6.4  
-----  
100H.: (6.1...6.6)  
-----  
Dispersion cm<sup>3</sup>/ : 0.3  
-----  
100H.: (0.5)  
-----  
2nd speed 1/min: 300.0  
Contr.-rod trav. m: 8.1...8.3  
Del.quantity cm<sup>3</sup>/ : 0.8...1.4  
100H.: (0.6...1.6)  
Dispersion cm<sup>3</sup>/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...1.00

Governor-spring reload  
Notch setting x : ?

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1100  
Charge press. hPa : 700  
Del.quantity cm<sup>3</sup>/ : 63.5...64.5  
1000H.: (61.5...66.5)  
Dispersion cm<sup>3</sup>/ : 3.00  
1000H.: (5.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 44...52

Testing:  
1st c-rod trav.mm : 9.90  
Speed 1/min : 1140...1150  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1190...1220  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1220...1250

N03

4th speed 1/min : 1350  
C-rod trav.mm : 0.30...1.70

#### LOWEST RATED SPEED I

Control-lever  
position degrees: -3  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 8.20

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 300  
C-rod trav.mm : 8.10...8.30  
C-rod trav.mm : 2.00  
Speed 1/min : 470...530

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 10.90...11.00  
2nd speed 1/min : 750  
C-rod trav.mm : 12.60...12.70  
3rd speed 1/min : 1000  
C-rod trav.mm : 11.50...11.70

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 750  
Pressure hPa : 700  
Contr.-rod trav.mm: 12.60...12.70

#### Measurement

Speed 1/min : 750  
1st pressure hPa : -  
C-rod trav.mm : 11.80...11.90  
2nd pressure hPa : 400  
C-rod trav.mm : 12.20...12.30

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 700  
Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/ : 72.5...74.5  
1000H.: (70.0...77.0)  
Charge press. hPa : -  
Speed 1/min : -  
Del.quantity cm<sup>3</sup>/ : 67.0...69.0  
1000H.: (64.5...71.5)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm<sup>3</sup>/ : 58.0...60.0  
1000H.: (56.0...62.0)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0

Remarks:  
Hydraulic latching of starting  
delivery.

Latching at 0.4 bar ... 0.5 bar.

Unlatching at 0.15 bar...0.25 bar.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 0 1  
Edition : 22.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 876 344  
Injection pump  
Pump designation : PES6A95D41ORS2625  
EP type number : 0 410 896 926  
Governor  
Governor design. : RSV325...1250A2C1159  
L  
Governor no. : 0 420 232 490

Customer-spec. information  
Customer : KHD

Engine : BF6L913C

1st version kW : 130.0  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)

N05

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 11.60...11.70

Del.quantity cm3/ : 9.3...9.5  
100H.: (9.1...9.7)

Dispersion cm3/ : 0.3  
100H.: (0.6)

2nd speed 1/min: 350.0  
Contr.-rod trav. m: 6.4...6.6  
Del.quantity cm3/ : 1.0...1.6  
100H.: (0.7...1.8)  
Dispersion cm3/ : 0.3  
100H.: (0.5)

## SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 4.25

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1250  
Charge press. hPa : 900  
Del.quantity cm3/ : 93.0...95.0  
1000H.: (91.0...97.0)  
Dispersion cm3/ : 3.50  
1000H.: (6.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 47...55

Testing:  
1st c-rod trav.mm : 10.60  
Speed 1/min : 1290...1300  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1345...1375  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1355...1385

4th speed 1/min : 1520  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 17...25  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 5.0

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 2.00  
Speed 1/min : 520...580

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 11.60...11.70  
2nd speed 1/min : 500  
C-rod trav.mm : 12.00...12.10  
4th speed 1/min : 1105  
C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 12.00...12.10

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 10.30...10.40  
2nd pressure hPa : 540  
C-rod trav.mm : 11.50...11.60  
3rd pressure hPa : 420  
C-rod trav.mm : 10.80...11.00

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 94.5...97.5  
1000H.: (92.0...100.0)  
Charge press. hPa : 900  
Speed 1/min : 1150  
Del.quantity cm3/ : 93.0...96.0  
1000H.: (90.5...98.5)  
Charge press. hPa : -  
Speed 1/min : 500

Del.quantity cm3/ : 54.0...56.0  
1000H.: (52.0...58.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 16.30...16.70  
APPLICATION  
Combine-harvester

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : RAB 10,8 A  
 Edition : 30.03.87  
 Superceeded : 5.84  
 Calibrating oil : ISO-4113  
 Combination no. : 0 401 276 051  
 Injection pump  
 Pump designation : PES6A100D41ORS3039  
 EP type number : 0 411 206 018  
 Governor  
 Governor design. : RSV475...950A1C2121L  
 Governor no. : 0 420 232 384

Customer-spec. information  
 Customer : RABA

Engine : D2156 MKTL6

1st version kW : 184.0  
 Speed 1/min: 1900

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 1.60...1.70  
 : (1.55...1.75)

Contr.-rod trav.mm: 9.00...12.00

N07

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

**BASIC SETTING**

1st speed 1/mi: 950

Contr.-rod trav.mm: 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 15.2...15.4

100H.: (15.0...15.6)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

2nd speed 1/min: 475.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100H.: (0.9...1.8)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.5)

**SLEEVE POSITION**

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30..

Governor-spring reload

Notch setting x : 3.75

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 950

Charge press. hPa : 750

Del.quantity cm<sup>3</sup>/ : 152.0...154.0

1000H.: (150.0...156.0)

Dispersion cm<sup>3</sup>/ : 3.00

1000H.: (6.00)

**HIGHEST RATED SPEED**

1st version

Control-lever

position degrees: 45...53

Testing:

1st c-rod trav.mm : 12.60

Speed 1/min : 990...1000

2nd c-rod trav.mm : 4.00

Speed 1/min : 1025...1055

3rd c-rod trav.mm : 4.00

Speed 1/min : 1030...1060  
4th speed 1/min : 1195  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 23...31  
Setting point w/out aux. spring  
Speed 1/min : 475  
Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 475  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 570...630  
Speed 1/min : 675  
C-rod trav.mm max : 1.00

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 950  
C-rod trav.mm : 13.60...13.70  
2nd speed 1/min : 500  
C-rod trav.mm : 15.70...15.80  
3rd speed 1/min : 840  
C-rod trav.mm : 14.90...15.10

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 750  
Contr.-rod trav.mm: 15.70...15.80

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 13.40...13.50  
2nd pressure hPa : 550  
C-rod trav.mm : 15.00...15.10  
3rd pressure hPa : 420  
C-rod trav.mm : 14.10...14.30

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 750  
Speed 1/min : 750  
Del.quantity cm3/ : 180.0...184.0  
1000H.: (178.0...186.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 0.0...149.0  
1000H.: (0.0...151.0)

NO8

Remarks:  
APPLICATION  
Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 7,1 A 4  
 Edition : 6.87  
 Superceeded : 11.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 401 846 505 E  
 Injection pump  
 Pump designation : PE6P110A32ORS483E  
 EP type number : 0 411 816 159  
 Governor  
 Governor design. : RQV250...1100PA499-1

Customer-spec. information  
 Customer : VOLVO

Engine : TD 71

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar : 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1-5-3-6-2-4

SD ang. spacing<sup>°</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.5(0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 11.20...11.30

Del.quantity cm3/ : 10.1...10.3

100H.: (9.8...10.6)

Dispersion cm3/ : 0.4

100H.: (0.75)

2nd speed 1/min: 250

Contr.-rod trav. m: 5.30...5.50

Del.quantity cm3/ : 1.6...2.0

100H.: (-)

Dispersion cm3/ : 0.3

100H.: (0.6)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1200

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 900

Del.quantity cm3/ : 101.0...103.0

1000H.: (98.0...106.0)

Dispersion cm3/ : 4.0

1000H.: (7.5)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 54...62

Testing:

1st c-rod trav.mm : 10.20

Speed 1/min : 1160...1170

2nd c-rod trav.mm : 4.00

Speed 1/min : 1260...1290

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 5...13

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.80  
Speed 1/min : 250  
C-rod trav.mm : 5.30...5.50

Permissible alteration from 2.20...2.90

#### CONSTANT REGULATION

Speed 1/min : 300...410

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 11.20...11.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 8.70...8.90  
2nd pressure hPa : 560  
C-rod trav.mm : 11.0...11.1  
3rd pressure hPa : 290  
C-rod trav.mm : 9.1...9.3

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 110.0...114.0  
1000H.: (107.0...117.0)  
Charge press. hPa : -  
Speed 1/min : 700  
Del.quantity cm3/ : 68.0...70.0  
1000H.: (65.0...73.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 170.0...200.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
1000H.: (-)  
Dispersion cm3/ : 3.0  
1000H.: (6.0)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.

N10



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 12.0 S  
Edition : 12.06.87  
Superceeded : -  
Calibrating oil : ISO-4113

Combination no. : 0 401 846 529

Injection pump  
Pump designation : PE6P120A32ORS3186  
EP type number : 0 411 826 756  
Governor  
Governor design. : RQV250..1025PA657-13  
Governor no. : 0 421 813 592

Customer-spec. information  
Customer : VOLVO

Engine : TD102F

1st version kW : 220.0  
Speed 1/min: 2050

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.60...2.70  
                  : (2.55...2.75)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. n<sup>o</sup>. : 1

#### BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm<sup>3</sup>/ : 19.7...19.9

100H.: (19.4...20.2)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 3.9...4.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.2

100H.: (1.4...2.4)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.7)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.20...1.30

2nd speed 1/min: 430

Sleeve travel mm: 3.50...3.80

3rd speed 1/min: 700

Sleeve travel mm: 6.40...6.60

4th speed 1/min: 900

Sleeve travel mm: 6.40...6.60

5th speed 1/min: 1080

Sleeve travel mm: 8.30...8.50

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1080

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 1000

Del.quantity cm<sup>3</sup>/ : 197.0...199.0

1000H.: (194.0...202.0)

Dispersion cm<sup>3</sup>/ : 5.00

1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 58...66

Testing:

1st c-rod trav.mm : 10.40

Speed 1/min : 1055...1065

2nd c-rod trav.mm : 4.00

Speed 1/min : 1110...1140

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 4..12

Testing:

Speed 1/min : 100

C-rod trav.mm min : 5.40

Speed 1/min : 250

C-rod trav.mm : 3.90...4.10

#### CONSTANT REGULATION

Speed 1/min : 250...350

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8.90...9.10

2nd pressure hPa : 770

C-rod trav.mm : 11.20...11.30

3rd pressure hPa : 420

C-rod trav.mm : 9.40...9.60

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -

Speed 1/min : 700

Del.quantity cm<sup>3</sup>/ : 149.0...151.0

1000H.: (146.0...154.0)

#### LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 3.90...4.10

Del. quantity cm<sup>3</sup>/ : 17.0...22.0  
1000H.: (14.5...24.5)  
Dispersion cm<sup>3</sup>/ : 5.00  
1000H.: (7.00)

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 X2  
Edition : 10.04.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 401 846 540  
Injection pump  
Pump designation : PE6P110A32ORS407-1  
EP type number : 0 411 816 147  
Governor  
Governor design. : RQ275/1000PA861  
Governor no. : 0 421 801 397

Customer-spec. information  
Customer : DAF

Engine : LT 195

1st version kW : 195.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per value: -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 12.80...12.90

Del.quantity cm3/ : 15.3...15.5

100H.: (15.0...15.7)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 7.2...7.4

Del.quantity cm3/ : 1.4...1.9

100H.: (1.1...2.1)

Dispersion cm3/ : 0.4

100H.: (0.7)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 15.40...16.60

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 600

Charge press. hPa : 700

Del.quantity cm3/ : 153.0...155.0

1000H.: (150.5...157.5)

Dispersion cm3/ : 4.00

1000H.: (7.50)

## HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 6.0

Testing:

1st c-rod trav.mm : 11.40

Speed 1/min : 1030...1045

2nd c-rod trav.mm : 4.00

Speed 1/min : 1100...1130

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 73...81

Setting point w/out aux. spring  
Speed 1/min : 275  
Contr.-rod trav.mm: 7.3

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.40  
Speed 1/min : 275  
C-rod trav.mm : 7.20...7.40  
C-rod trav.mm : 2.50  
Speed 1/min : 340...380

TORQUE CONTROL

Dimension a mm : 0.25  
Torque-control curve - 1st version  
1st speed 1/min : 600  
C-rod trav.mm : 13.00...13.10  
2nd speed 1/min : 980  
C-rod trav.mm : 12.40...12.60  
3rd speed 1/min : 900  
C-rod trav.mm : 12.50...12.80

compensator (LDA,ADA,ALDA)

1st version

Setting  
Speed 1/min : 600  
Pressure hPa : 700  
Contr.-rod trav.mm: 12.80...12.90

Measurement

Speed 1/min : 600  
C-rod trav.mm : 11.70...11.90  
2nd pressure hPa : 340  
C-rod trav.mm : 12.50...12.60  
3rd pressure hPa : 310  
C-rod trav.mm : 12.10...12.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700  
Speed 1/min : 980  
Del.quantity cm3/ : 145.5...149.5  
1000H.: (142.5...152.5)  
Speed 1/min : 600  
Del.quantity cm3/ : 130.0...132.0  
1000H.: (127.5...134.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 245.0...285.0  
1000H.: (241.0...289.0)  
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

N15

Speed 1/min : 275  
Contr.-rod trav.mm: 7.20...7.40  
Del.quantity cm3/ : 14.0...19.0  
1000H.: (11.5...21.5)  
Dispersion cm3/ : 4.50  
1000H.: (7.50)

Remarks:

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 X3  
 Edition : 02.06.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 401 846 541  
 Injection pump  
 Pump designation : PE6P110A32ORS407-1  
 EP type number : 0 411 816 147  
 Governor  
 Governor design. : RQ275/110CPA864  
 Govenner no. : 0 421 801 400

Customer-spec. information  
 Customer : DAF

Engine : LT 210

1st version kW : 210.0  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 600  
 -----  
 Contr.-rod trav.mm: 12.90...13.00  
 -----  
 Del.quantity cm3/ : 15.5...15.7  
 -----  
 100H.: (15.2...15.9)  
 -----  
 Dispersion cm3/ : 0.4  
 -----  
 100H.: (0.7)  
 -----  
 2nd speed 1/min: 275.0  
 Contr.-rod trav. m: 7.2...7.4  
 Del.quantity cm3/ : 1.4...1.9  
 100H.: (1.1...2.1)  
 Dispersion cm3/ : 0.4  
 100H.: (0.7)

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 600  
 Cont.-rod travelmm: 15.20...16.40

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 600  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 155.0...157.0  
 1000H.: (152.5...159.5)  
 Dispersion cm3/ : 4.00  
 1000H.: (7.50)

## HIGHEST RATED SPEED

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 15.8

## Testing:

1st c-rod trav.mm : 11.50  
 Speed 1/min : 1135...1150  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1180...1210  
 4th speed 1/min : 1300  
 C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 275  
Contr.-rod trav.mm: 7.3

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.40  
Speed 1/min : 275  
C-rod trav.mm : 7.20...7.40  
C-rod trav.mm : 2.00  
Speed 1/min : 350...390

TORQUE CONTROL

Dimension a mm : 0.25  
Torque-control curve - 1st version  
1st speed 1/min : 600  
C-rod trav.mm : 13.10...13.20  
2nd speed 1/min : 1080  
C-rod trav.mm : 12.50...12.70  
3rd speed 1/min : 850  
C-rod trav.mm : 12.80...12.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 600  
Pressure hPa : 700  
Contr.-rod trav.mm: 12.90...13.00

Measurement

Speed 1/min : 600  
1st pressure hPa : -  
C-rod trav.mm : 11.70...11.90  
2nd pressure hPa : 310  
C-rod trav.mm : 12.60...12.70  
3rd pressure hPa : 270  
C-rod trav.mm : 12.10...12.30

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700  
Speed 1/min : 1080  
Del.quantity cm3/ : 147.0...151.0  
1000H.: (144.0...154.0)  
Charge press. hPa : -  
Speed 1/min : 600  
Del.quantity cm3/ : 130.0...132.0  
1000H.: (127.5...134.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 245.0...285.0  
1000H.: (241.0...289.0)  
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 275  
Contr.-rod trav.mm: 7.20...7.40  
Del.quantity cm3/ : 14.0...19.0  
1000H.: (11.5...21.5)  
Dispersion cm3/ : 4.50  
1000H.: (7.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6M14  
Edition : 02.06.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 401 846 542  
  
Injection pump  
Pump designation : PE6P100A320RS384-1  
EP type number : 0 411 806 189  
Governor  
Governor design. : RQ225/1000PA868  
Governor no. : 0 421 801 403

Customer-spec. information  
Customer : DAF

Engine : DKDL 1160 SB 220

1st version kW : 220.0  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
: (3.15...3.35)  
Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 600  
-----  
Contr.-rod trav.mm: 11.40...11.50  
-----  
Del.quantity cm3/ : 9.8...10.0  
-----  
100H.: (9.6...10.2)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.6)  
-----  
  
2nd speed 1/min: 250.0  
Contr.-rod trav. m: 7.5...7.7  
Del.quantity cm3/ : 0.9...1.3  
100H.: (0.6...1.5)  
Dispersion cm3/ : 0.3  
100H.: (0.5)

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 550  
Cont.-rod travelmm: 15.20...16.40

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 600  
Del.quantity cm3/ : 98.0...100.0  
1000H.: (96.0...102.0)  
Dispersion cm3/ : 3.50  
1000H.: (6.00)

## HIGHEST RATED SPEED

Setting point:  
Speed 1/min : 550  
Contr.-rod trav.mm: 15.8

Testing:  
1st c-rod trav.mm : 9.60  
Speed 1/min : 1045...1060  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1100...1130  
4th speed 1/min : 1250  
C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 250



Contr.-rod trav.mm: 7.6

Testing:

Speed 1/min : 100  
C-rod trav.mm : 8.40  
Speed 1/min : 250  
C-rod trav.mm : 7.50...7.70  
C-rod trav.mm : 2.00  
Speed 1/min : 345...385

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 600  
C-rod trav.mm : 11.40...11.50  
2nd speed 1/min : 1000  
C-rod trav.mm : 10.60...10.80  
3rd speed 1/min : 820  
C-rod trav.mm : 11.20...11.40  
4th speed 1/min : 900  
C-rod trav.mm : 10.80...11.10

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1000  
Del.quantity cm3/ : 93.0...97.0  
1000H.: (90.5...99.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 180.0...220.0  
1000H.: (176.0...224.0)  
Contr.-rod trav.mm: 19.50...21.00

LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 7.50...7.70  
Del.quantity cm3/ : 9.0...13.0  
1000H.: (6.5...15.5)  
Dispersion cm3/ : 3.50  
1000H.: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0 R5  
Edition : 30.03.87  
Superceeded : 1.83  
Calibrating oil : ISO-4113  
  
Combination no. : 0 401 846 734  
  
Injection pump  
Pump designation : PE6P110A72ORS3040  
EP type number : 0 411 816 713  
Governor  
Governor design. : RQV200...1000PA555  
Governor no. : 0 421 813 280

Customer-spec. information  
Customer : SCANIA

Engine : DS11 14

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
                  : (3.25...3.45)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 600  
-----

Contr.-rod trav.mm: 13.60...13.70  
-----

Del.quantity cm3/ : 17.5...17.7  
-----

100H.: (17.3...17.9)  
-----

Dispersion cm3/ : 0.6  
-----

100H.: (0.8)  
-----

2nd speed 1/min: 225.0

Contr.-rod trav. m: 4.4...4.6

Del.quantity cm3/ : 1.7...2.1

100H.: (-)

Dispersion cm3/ : 0.2

100H.: (0.4)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1050

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

### 1st version

Speed 1/min: 600

Charge press. hPa : 700

Del.quantity cm3/ : 175.0...177.0

1000H.: (173.0...179.0)

Dispersion cm3/ : 6.00

1000H.: (8.00)

## HIGHEST RATED SPEED

### 1st version

Control-lever

position degrees: 56...64

### Testing:

1st c-rod trav.mm : 12.60

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00

Speed 1/min : 1150...1180

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 5...13

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.90  
Speed 1/min : 225  
C-rod trav.mm : 4.40...4.60  
C-rod trav.mm : 2.00  
Speed 1/min : 320...380

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 13.60...13.70

Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 11.70...11.80  
2nd pressure hPa : 410  
C-rod trav.mm : 13.20...13.30  
3rd pressure hPa : 260  
C-rod trav.mm : 12.20...12.40

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700  
Speed 1/min : 1000  
Del.quantity cm3/ : 169.5...174.5  
1000H.: (167.0...177.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 127.0...131.0  
1000H.: (125.0...133.0)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4.40...4.60  
Del.quantity cm3/ : 17.0...21.0  
Dispersion cm3/ : 2.00  
1000H.: (4.00)

Remarks:

ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Start of delivery - engine: 20° before  
TDC  
Firing sequence of engine:  
1-5-3-6-2-4.

Scania test specifications taken over  
on Aug. 30, 1984

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,0 M  
Edition : 21.5.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 401 846 741  
Injection pump  
Pump designation : PE6P110A320 S3814  
EP type number : 0 411 816 721  
Governor  
Governor design. : RQV350...1150PA378R  
Governor no. : 0 421 813 294

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM421

1st version kW : 159.0  
Speed 1/min: 2300  
2nd version kW : 159.0  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...110

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY

N22

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 3- 5- 2- 4- 1

SD ang. spacing<sup>o</sup>CS: 0-45-120-165-240-285  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 12.70...12.80

Del.quantity cm3/ : 13.4...13.6

100H.: (13.1...13.8)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 350

Contr.-rod trav. m: 8.2...8.4

Del.quantity cm3/ : 1.3...1.9

100H.: (1.0...2.1)

Dispersion cm3/ : 0.4

100H.: (0.8)

1st speed 1/min: 1130

Contr.-rod trav.mm: 12.7...12.8

Del.quantity cm3/ : 12.3...12.5

100H.: (-)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 350

Contr.-rod trav.mm: 8.20...8.40

Del.quantity cm3/ : 1.3...1.9

100H.: (-)

Dispersion cm3/ : 0.4

100H.: (0.7)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.60...0.90

2nd speed 1/min: 580

Sleeve travel mm: 3.60...3.70

3rd speed 1/min: 870

Sleeve travel mm: 5.20...5.30

4th speed 1/min: 1150

Sleeve travel mm: 7.60

SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1150  
Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150  
Del.quantity cm3/ : 134.0...136.0  
1000H.: (131.5...138.5)  
Dispersion cm3/ : 4.00  
1000H.: (8.00)

2nd version

Speed 1/min: 1130  
Del.quantity cm3/ : 123.0...125.0  
1000H.: (120.0...128.0)  
Dispersion cm3/ : 4.0  
1000H.: (8.0)

HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 62...70

Testing:

1st c-rod trav.mm : 11.70  
Speed 1/min : 1180...1190  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1285...1315  
3rd c-rod trav.mm : 1400  
Speed 1/min : 0.00...1.00

2nd version

Control-lever  
position degrees: 62...70

Testing:

1st c-rod trav.mm : 11.70  
Speed 1/min : 1180...1190  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1285...1315  
3rd c-rod trav.mm : 1400  
Speed 1/min : 0.00...1.00

LOWEST RATED SPEED I

Control-lever

position degrees: 12...20

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.50  
Speed 1/min : 350  
C-rod trav.mm : 8.20...8.40

CONSTANT REGULATION

Speed 1/min : 375...485

SWITCH-OVER POINT

Speed 1/min : 270 (290)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 113.0...117.0  
1000H.: (110.0...120.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)  
Speed 1/min : 1150  
Del.quantity cm3/ : 93.0...97.0 \*  
1000H.: (90.0...100.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)  
Speed 1/min : -  
Del.quantity cm3/ : -  
1000H.: (-)

Remarks:

Version 1: Without return-flow  
restriction  
Version 2: With return-flow restriction  
\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 0  
Edition : 12.06.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 401 846 745  
  
Injection pump  
Pump designation : PE6P110A32ORS3080  
EP type number : 0 411 816 722  
Governor  
Governor design. : RQV250...1100PA589  
Governor no. : 0 421 813 307

Customer-spec. information  
Customer : VOLVO

Engine : TD100GA

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700  
-----  
Contr.-rod trav.mm: 12.30...12.40  
-----  
Del.quantity cm<sup>3</sup>/ : 16.7...16.9  
-----  
100H.: (16.4...17.2)  
-----  
Dispersion cm<sup>3</sup>/ : 0.4  
-----  
100H.: (0.7)  
-----

2nd speed 1/min: 250.0  
Contr.-rod trav. m: 3.8...4.0  
Del.quantity cm<sup>3</sup>/ : 1.5...1.9  
100H.: (1.2...2.1)  
Dispersion cm<sup>3</sup>/ : 0.3  
100H.: (0.6)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 250  
Sleeve travel mm: 1.20...1.30  
2nd speed 1/min: 370  
Sleeve travel mm: 2.60...3.00  
3rd speed 1/min: 430  
Sleeve travel mm: 3.50...3.90  
4th speed 1/min: 1160  
Sleeve travel mm: 8.10...8.30  
5th speed 1/min: 1210  
Sleeve travel mm: 9.40...9.60

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1180  
Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 700  
Charge press. hPa : 900  
Del.quantity cm<sup>3</sup>/ : 167.0...169.0  
1000H.: (164.0...172.0)  
Dispersion cm<sup>3</sup>/ : 4.00  
1000H.: (7.50)

## HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 59...67

Testing:

1st c-rod trav.mm : 11.30  
Speed 1/min : 1160...1170  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1220...1250  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 4...12

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.30  
Speed 1/min : 250  
C-rod trav.mm : 3.80...4.00

CONSTANT REGULATION

Speed 1/min : 270...380

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 12.30...12.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 9.80...9.90  
2nd pressure hPa : 610  
C-rod trav.mm : 12.10...12.20  
3rd pressure hPa : 280  
C-rod trav.mm : 10.10...10.30

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -  
Speed 1/min : 700  
Del.quantity cm3/ : 121.0...124.0  
1000H.: (118.5...126.5)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 160.0...190.0  
1000H.: (156.0...196.0)  
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

N25

Speed 1/min : 250  
Contr.-rod trav.mm: 3.80...4.00  
Del.quantity cm3/ : 15.0...19.0  
1000H.: (12.5...21.5)  
Dispersion cm3/ : 3.00  
1000H.: (6.00)

Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 10,0 Q5  
 Edition : 13.05.87  
 Superceeded : 6.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 401 846 753  
 Injection pump  
 Pump designation : PE6P110A32ORS3108  
 EP type number : 0 411 816 727  
 Governor  
 Governor design. : RQV325...1100PA232  
 Governor no. : 0 421 813 309

Customer-spec. information  
 Customer : VOLVO-BM

Engine : TD100G

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)

Contr.-rod trav. mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav. mm: 11.50...11.60

Del. quantity cm<sup>3</sup>/ : 14.8...15.0

100H.: (14.5...15.3)

Dispersion cm<sup>3</sup>/ : 0.4

100H.: (0.8)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 3.9...4.1

Del. quantity cm<sup>3</sup>/ : 1.6...2.0

100H.: (1.3...2.2)

Dispersion cm<sup>3</sup>/ : 0.3

100H.: (0.6)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 325

Sleeve travel mm: 1.60...1.70

2nd speed 1/min: 500

Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 800

Sleeve travel mm: 5.00...5.20

4th speed 1/min: 1100

Sleeve travel mm: 7.60...7.80

5th speed 1/min: 1200

Sleeve travel mm: 8.70...9.00

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1175

Cont.-rod travel mm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700

Charge press. hPa : 700

Del. quantity cm<sup>3</sup>/ : 148.0...150.0

1000H.: (145.0...153.0)

Dispersion cm<sup>3</sup>/ : 4.00

1000H.: (8.00)

## HIGHEST RATED SPEED

1st version



Control-lever  
position degrees: 40...48

Testing:

1st c-rod trav.mm : 10.50  
Speed 1/min : 1140...1150  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1220...1250  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 7...15

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.40  
Speed 1/min : 325  
C-rod trav.mm : 3.90...4.10  
C-rod trav.mm : 2.00  
Speed 1/min : 340...400

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 9.70...9.80  
2nd pressure hPa : 500  
C-rod trav.mm : 11.30...11.40  
3rd pressure hPa : 300  
C-rod trav.mm : 10.00...10.20

FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : -  
Speed 1/min : 700  
Del.quantity cm3/ : 115.0...117.0  
1000H.: (112.0...120.0)

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 170.0...200.0  
1000H.: (156.0...204.0)  
Contr.-rod trav.mm: 20.00...21.00

LOW IDLE

Speed 1/min : 325

N27

Contr.-rod trav.mm: 3.90...4.10  
Del.quantity cm3/ : 16.0...20.0  
1000H.: (13.5...22.5)  
Dispersion cm3/ : 3.00  
1000H.: (6.00)

Remarks: